The Determinants of the Financial Performance of Insurance Companies in Mauritius

A minor dissertation submitted in partial fulfilment of the requirement for the award of the degree of

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COMPULSORY DECLARATION

This work has not been previously submitted in whole, or in part, for the award of any degree. It is my own work. Each significant contribution to, and quotation in, this dissertation from the work, or works, of other people has been attributed, and has been cited and referenced.

Signature: Signed by candidate Date: 30/08/2019

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LIST OF ABBREVIATIONS

FSC	Financial Services Commission
MUR	Mauritian Rupee
USD	United States Dollar
ROA	Return on Assets
UWPR	Underwriting Profit ratio
LGWP	Natural Logarithm of gross written premium
HHI	Herfindahl Hirschman Index
LEVR	Leverage ratio
LTA	Natural logarithm of total assets
FX	Foreign exchange rate
GDPG	Gross domestic product growth rate
INF	Inflation rate
S-C-P	Structure Conduct Performance
ES	Efficient Structure
OLS	Ordinary Least Squares
LM	Lagrange Multiplier

ABSTRACT

The study examines the effects of internal factors, made up of firm specific variables, and the external factors, consisting of industry and macroeconomic variables, on the financial performance of insurance companies in Mauritius. In particular, the study investigates the impact of firm size, leverage, gross written premiums, reinsurance, combined ratio, market concentration, foreign exchange, inflation and GDP growth on the profitability of insurers in both the life and the non-life markets. Profitability was proxied by return on assets (ROA) and the underwriting profit ratio (UWPR). The study employs an unbalanced panel data sample of twenty non-life and seventeen life insurers from 2008 to 2016, with one hundred and twenty-two (122) non-life and ninety-eight (98) life firm-year panel observations obtained from the Financial Services Commission (FSC) of Mauritius. The models were estimated using the sandwich estimator by White, (1980) and Eicker, (1963) within pooled OLS, fixed and random effects panel estimation techniques. The findings show that, a unit increase in the combined ratio and leverage of life insurers impact negatively on the return on assets (ROA), while an increase in reinsurance dependence and firm size impact underwriting profit ratio positively. In the non-life sector, the findings show that insurance companies' profitability is positively impacted by increases in the combined ratio and gross written premium, while market concentration and foreign exchange negatively impacted non-life insurers' profitability. The findings of the study help us to understand firm pricing behaviour within the insurance industry and help to protect consumer interests in the pricing of policies. The findings also have implications on the growth strategies and risk management activities of insurance companies in Mauritius.

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND TO THE STUDY

Financial institutions have come to be known for their crucial contribution to the success of many economies. The contributions of financial institutions to economic success, as evidenced from the 2007-2008 financial crisis and its impact, have drawn the attention of academia into investigating various aspect of the sectors' performance and risk related issues. At the centre of this growing interest specifically regarding financial performance of the insurance sector, is the important contribution of insurance in the general economic development and wealth creation of a country. Insurance can be defined as a means of providing protection against possible eventualities through specialised functions such as funds mobilisation for investments and the underwriting of risks.

Many aspects of life and business depend on the effectiveness of insurance to embark on various projects and decisions such as business investments, acquiring property and long-term insurance. Insurance is one major means whereby people and businesses share and transfer their risks to third parties, especially for those risks that cannot be avoided in the value creation processes, irrespective of sector. One way to absorb risk and ensure stability of financial activities by firms into the foreseeable future, is by way of insurance or reinsurance.

The types of insurance are mostly categorized under two main business models namely, general insurance business and long-term insurance business, also referred to as "non-life" and "life" insurance respectively. The business of general insurance comprises those non-life and short-term insurance policies such as property and liability insurance, motor insurance, accident and health insurance, engineering, transportation and guarantee, among many others. Long-term insurance on the other hand comprises those long-term related policies such as life assurance, permanent health insurance, pension, and linked long term insurance.

In recent times, much attention has been drawn to the determinants of insurance companies' profitability owing to the direct impact of insurer profitability on all stakeholders such as; shareholders, consumers, investors, and employees (Kaya, 2015). Alomari and Azzam, (2017) considers insurance as a "complementary sector for the financial, production and services sectors"

of any economy. Furthermore, efficient allocation of resources is achieved through a well-developed insurance sector by functions such as the transfer of risk and mobilisation of savings (Charumathi, 2012). As underwriters, these companies are not only providing good mechanisms for transferring risk but also help to boost entrepreneurial confidence in appropriate ways, so as to support investment growth and general economic activities (Kazeem, 2012).

In a summary, the contributions of the insurance industry to general economic developments include; the transfer, absorption and spread of financial risks and losses, promotion of investments through the creation of businesses and embarking on projects, the efficient allocation of resources and the promotion of savings.

1.2 PROBLEM STATEMENT

"The insurance industry is expected to be financially solvent and strong through its being profitable in operations" (Sambasivam & Ayele, 2013, p5). This is because institutional insolvency of insurance companies can result in systematic risks which adversely impact a country in general (Naveed et al., 2011). Although profitability is a major financial performance indicator, it does not guarantee a firm's continuity but it contributes to stakeholder wealth maximization, which is very crucial to the existence of a company. Various stakeholders of a company, especially capital contributors in the form of equity and debt providers want to see a company move in the direction of profitability to encourage continuous support in the form of investments and loans. Profits also serve as a main source of internal funding for company growth, it improves the level of solvency, increases competition and attracts prospective investors.

This requires insurance companies to remain profitable and to call for investigating those factors that impact financial performance in terms of profitability, to guide various stakeholders in their decisions. Despite the significant role of insurance to economic success, most empirical investigations within the financial sector have centred mostly on banks, with the insurance industry only receiving attention in recent works (Akotey et al., 2015). The insurance industry, like any other industry is affected by various factors at the firm level such as size, capital, leverage and reinsurance policies; at the industry level by factors such as market competition and structure; and at the macroeconomic level by factors such as; unemployment, interest rate, fluctuations in exchange rate, money supply, inflation rate, GDP growth, and other fiscal and monetary policies.

As the insurance industry in Mauritius continues to experience growth, it is imperative that, we understand what factors are critical and most likely to impact future performance by examining determinants of past performances, to draw meaningful conclusions. This is specially due to the fact that empirical findings from relevant literature have shown great inconsistencies in the factors that determine financial performance across countries, different insurance markets and over different periods hence, contributing to our inability to generalise findings from any one particular study. That is, literature review shows that, different factors explain the performance of insurers in different insurance categories (life and non-life) and across different geographical markets. Hence it is difficult to apply findings in one market or country to another.

This paper therefore seeks to empirically determine the relevant factors that impact profitability specifically in the Mauritian insurance markets of both non-life and life, and to stimulate further research and interest in the Mauritian insurance industry.

1.3 MOTIVATION AND IMPORTANCE OF STUDY

The importance of insurance and its interconnection with other sectors in an economy calls for insurance as a basic life requirement. However, there is poor performance and slow growth of insurance companies in Africa and in most emerging markets, relative to developed countries. This accounts to an extent for the slow and stagnated economic development involving quality investments in these destinations. Agabi, (2009) found that, the general loss of interest in insurance companies in Nigeria span reasons such as loss of goodwill from extended periods of non-payment of claims by underwriting firms. The inability of insurers to honour claims in the case of Nigeria and similarly in many African countries is generally due to poor financial performances caused either by the absence or excess application and proportion of various internal and external factors which may not be known.

The interconnection between insurance and other economic activities, makes the performance of insurers a critical success factor for any country as it reflects directly and mirrors performance in the economy. This is even more important in the specific case of Mauritius, which is known to have transformed from an island with an agricultural background and beaches to a financial hub with well-developed insurance and banking sectors in Africa.

This study adds to the empirical findings of Boyjoo, T., and Ramesh, V. (2017) and Boyjoo, T., Ramesh, V., and Jaunky, V.C. (2017) on the life and general insurance sectors in Mauritius but includes a wider scope spanning 2008 to 2016 thus, three (3) years post implementation of the 2015 economic reforms by the government to open up the Mauritian economy. The study also empirically compares the impact of both firm and macro factors on the performance of insurers and further examines the relationship between market structure and insurer performance, by testing the traditional economic theory of Structure-Conduct-Performance (S-C-P).

Finally, this study is necessary to guide firm behaviour in terms of competition, and organizational strategy, impact regulatory policies, influence the investment decisions of investors, and finally to guide professionals, and academia. Thus, this paper guides all stakeholders whatever their stake may be in the industry, to maintain and improve on the industry's success to drive general economic development.

1.4 OBJECTIVES

The objective of the study is to examine the effect of the internal and external factors that influence insurance companies' profitability in Mauritius across firm level, industry and macro levels.

1.4.1 RESEARCH QUESTIONS

The research questions from the objectives of the study include:

1. What internal factors impact significantly on the profitability of insurance companies in Mauritius?

2. What external factors impact significantly on the profitability of insurance companies in Mauritius?

1.4.2 HYPOTHESIS

Based on the objectives outlined above, the study seeks to test the following hypotheses:

Ho Market structure has no impact on the profitability of insurance firms in Mauritius.

Ho Combined ratio has no impact on the profitability of insurance firms in Mauritius.

Ho Firm size has no significant impact on the profitability of insurance firms in Mauritius.

Ho Gross premium has no impact on the profitability of insurance firms in Mauritius.

Ho Leverage has no impact on the profitability of insurance firms in Mauritius.

Ho Reinsurance ratio has no impact on the profitability of insurance firms in Mauritius.

Ho GDP growth has no impact on the profitability of insurance firms in Mauritius.

Ho The Foreign Exchange rate has no impact on the profitability of insurance firms in Mauritius.

Ho The Inflation rate has no impact on the profitability of insurance firms in Mauritius.

1.5 ORGANIZATION OF THE RESEARCH

The remaining sections of the paper are organized into chapter 2 on the overview of the Mauritian Insurance Sector, chapter 3 on the review of the theoretical framework and concepts, chapter 4 covers literature review, chapter 5 discusses the data and methodology, chapter 6 discusses the results and findings of the studies and chapter 7 discusses the implications of the findings and makes recommendations to conclude the study.

CHAPTER 2

OVERVIEW OF THE MAURITIUS INSURANCE SECTOR

Global insurance profitability continues to be under pressure in both the non-life and life markets with most major markets operating below-average profitability (Swiss Re, No.4/2018). The price or underwriting cycle and investment performance remain the two most important factors shaping profitability (Swiss Re, 2008). Thus, in the life segment, low interest rates are affecting investment returns while competition and regulatory changes have also contributed to the increased pressure on profitability (Swiss Re, No.3/2018). Also, the global non-life insurance sector is at a weak phase of the profitability cycle with decreasing return on equity due factors such as soft underwriting conditions and weak investment performance (Swiss Re, No.4/2018). Evidence also points to the fact that the underwriting results for non-life insurers show a strong cyclical pattern, highly correlated among the major markets and usually detected by the underwriting margin (Swiss Re, 2008).

The adverse effect of high inflation rates and low interest rates, in addition to the under-performance of most equity markets makes profitability from investment activities very limited and calls for improved underwriting performances globally. Global real premium growth from 2007 to 2016 averaged 1.4% compared to the 1.5% growth in 2017 (Swiss Re, No.3/2018) for both insurance markets and the global outlook is expected to improve in the future. Africa's total insurance premium volume in 2015 amounted to USD$64 billion with South Africa having the largest share of about seventy-two percent (72%) (Schanz, Alms & Company, 2016). Political instability coupled with civil unrest and corruption has not only slowed down economic activities but has impeded insurance market development in Africa. Insurance penetration remains low in Africa and indicates a high potential for growth opportunities in the industry.

Insurance penetration, a metric for the volume of insurance activities is measured as the proportion of premium income to a country's gross domestic product (GDP). According to PWC's African insurance survey, the African country with the highest insurance penetration rate is South Africa with about 16.99% penetration rates as at 2017 (PWC, 2018). Mauritius on the other hand, is one of Africa's economies with growing insurance activities as shown in the table below. Insurance penetration for Mauritius recorded a maximum of six and a half percent (6.5%) and a minimum of four percent (4%) between 2008 and 2016 as shown in table1.

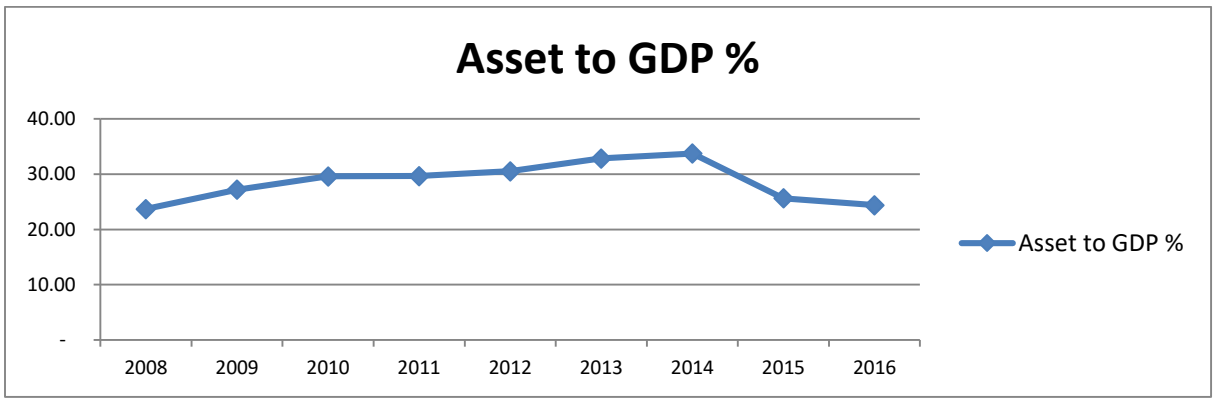
Another indicator of growing insurance activities is the insurance asset to GDP ratio. According to St. Louis Federal Reserve Economic Data (FRED), the insurance industry in Mauritius records significant asset to GDP ratios ranging from about twenty-four percent (24%) of GDP to thirty-four percent (34%) of GDP for the period 2008 to 2016, as shown in the graph below. On the average, insurance penetration rate stands at 5.24% and assets of insurance companies to GDP ratio is about 28.59; almost a third of the size of the economy. The growing penetration rates and insurance asset to GDP ratios indicate the significant level of insurance operations to the growth of the Mauritian economy.

Table 1: Total premium income and Insurance penetration rate in Mauritius

YEAR	Total industry premium income (000 MUR)	Premium growth rate (%)	Insurance Penetration rate (%)
2016	17,729,245	5.07	4.08
2015	16,874,449	10.00	4.03
2014	15,339,991	-30.45	4.34
2013	22,056,535	9.84	6.45
2012	20,081,501	4.59	6.20
2011	19,200,213	9.48	6.42
2010	17,537,359	18.94	5.69
2009	14,744,991	6.64	4.81
2008	13,826,353	18.71	5.24

Data source: FSC, World Bank; author's own calculation of penetration rates

Figure 1: Mauritius Insurance asset to GDP



Source: St. Louis Federal Reserve Economic Data (FRED, 2017)

Mauritius enjoys relatively stable and increasing growth in its economy, derived from sound political and economic policies that encourage private sector participation in economic

development. The financial sector enjoys remarkable growth relative to most African countries within the insurance sector proving to be very dynamic, showing growth of more than five percent (5%) year on year. According to the Mauritius Financial Services Commission (FSC), Mauritius has a total number of twenty-two direct insurers with seven in the business of long-term insurance and fifteen in the business of general insurance.

In Mauritius, the business of long-term insurance comprises; pensions, permanent health insurance, life assurance, and linked long-term insurance, while the business of general insurance includes; motor insurance, property, liability, transportation, accident and health, guarantee, engineering, and miscellaneous business. According to the FSC's 2016/2017 annual report, long-term insurance business in 2016 accumulated a premium of about MUR 9.7 billion to the MUR 9.3 billion in 2015 (FSC Mauritius, 2016/2017) thus showing a four percent (4%) growth.

The business of general insurance on the other hand, accumulated premiums of about MUR 8.0 billion in 2016 relative to the MUR 7.6 billion in 2015 (FSC Mauritius, 2016/2017). Total assets for long-term insurance business stood at MUR 89,561,675,000 with a total of 300,600 policies in 2016 from MUR 86,756,513,000 and 281,884 policies in 2015, indicating a three percent (3%) growth in assets and a seven percent (7%) growth in policies.

Total assets for general insurance business in 2016 was MUR 15,920,403,000 with about 553, 315 policies compared to MUR 16,670,355,000 and 523,553 policies in 2015, showing a four percent (4%) contraction in assets and a six percent (6%) increase in policies.

There was a nine percent (9%) increase in claims for long-term business in 2016 with about 8, 069,491 claims compared to 7,394,145 claims in 2015. On the other hand, the business of general insurance recorded claims of about 4,453,043 in 2016 compared with the 4,030,271 claims in 2015, showing a ten percent (10%) increase in claims as reported in the 2016 FSC annual statistical bulletin.

The figures below show a brief overview of the financial performance of direct insurers in Mauritius in both life and non-life markets.

Figure 2: Financial performance of Long-term Insurance Business

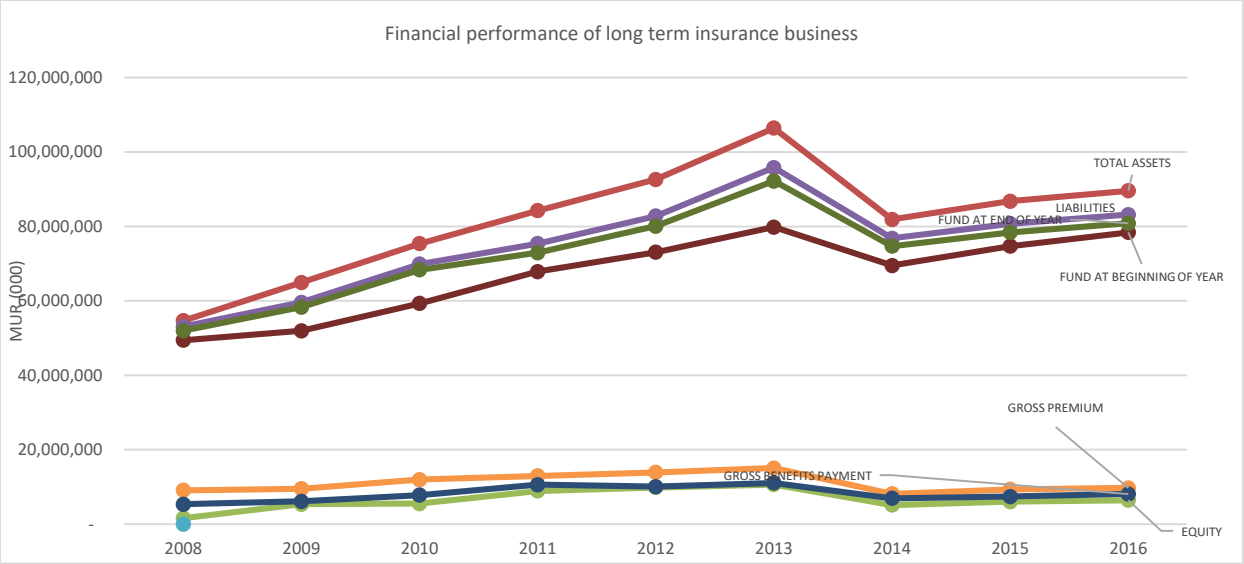
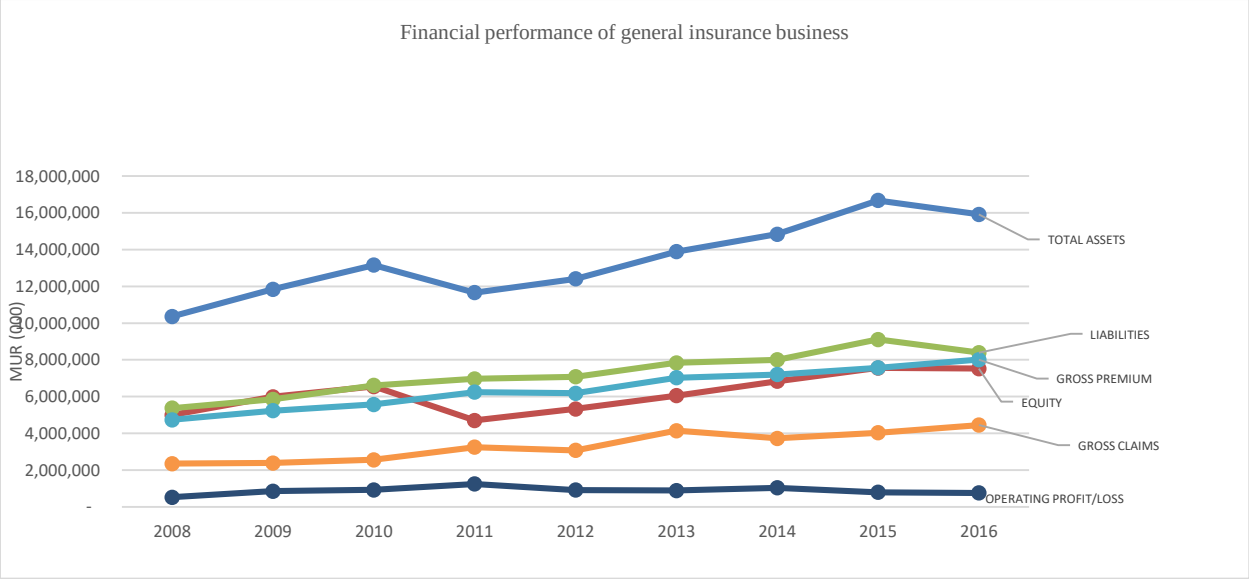


Figure 3 Financial performance of General Insurance Business



The insurance regulatory framework in Mauritius focuses on elements such as solvency monitoring, asset diversification, international reporting standards and actuary methods (Vittas, 2003). Insurance in Mauritius is deregulated from direct controls on price, product, investment and reinsurance, and this encourages intense competition among insurers. The insurance industry especially that of the life sector has few major players and is considered highly concentrated, notwithstanding the fact that the industry is still seen as competitive.

The top three companies in the non-life market occupy about a sixty-eight percent (68%) share of the market, broken down into 29.1% share for Swan, 23.7% share for Mauritius Union and a 14.8% share for Mauritius Eagle.

The life insurance market in Mauritius remains the largest insurance sector with about 55.2% of the total market. The life insurance market records higher industry concentrations, with the top three companies consisting of about ninety-two percent (92%) of the sector's market share, comprising SICOM Life with a forty-eight percent (48%) market share, Anglo Mauritius with 36.4% share and La Prudence Life with a 7.3% market share.

Table 2 below shows the concentration ratios for the industry leader measured by CR1, the concentration ratio of the top two players measured by CR2, the top three players measured by CR3 and the top four market players measured by (CR4) in both markets.

Table 2: Life and non-life insurance concentration ratios

	NON-LIFE Sample Concentration ratios				**LIFE Sample Concentration ratios**			
	CR1	**CR2**	**CR3**	**CR4**	**CR1**	**CR2**	**CR3**	**CR4**
2016	0.30	0.54	0.68	0.77	0.44	0.84	0.92	0.96
2015	0.29	0.53	0.68	0.77	0.48	0.84	0.92	0.95
2014	0.28	0.51	0.65	0.74	0.50	0.73	0.92	0.96
2013	0.29	0.53	0.65	0.74	0.48	0.71	0.91	0.95
2012	0.27	0.52	0.64	0.73	0.44	0.71	0.90	0.95
2011	0.24	0.46	0.57	0.68	0.61	0.86	0.92	0.95
2010	0.22	0.40	0.52	0.64	0.50	0.72	0.88	0.91
2009	0.21	0.36	0.48	0.60	0.45	0.68	0.85	0.89
2008	0.20	0.38	0.51	0.64	0.45	0.65	0.84	0.88

Following the Captive, Insurance Act in 2015, which allows a wholly owned subsidiary to provide insurance to its parent and affiliated groups (Mauritius IFC, 2016); the FSC also issued the pure captive rules in 2016, to strengthen the frame work for the captive insurance business in Mauritius. These captive insurance rules state the capital requirements, reporting standards and solvency (FSC Mauritius, 2016/2017). Mauritius currently has one operational captive insurer with about eight captive agents licensed by the FSC in Mauritius (FSC Mauritius, 2016/2017). Current works

are ongoing to allow licensing of third-party captive insurers, which is to serve as an avenue for financial sector development, respond to new challenges and to achieve other economic objectives such as sustainability and creation of employment.

Similar developments and restructuring by the FSC in its 2016 annual reports include integrating the funeral schemes management as a new line of financial service and providing license to such operators to allow for oversight and regulation of this sector. In addition, the FSC wants insurance operations to be risk-based in conformity with acceptable international practices and standards (FSC Mauritius, 2016). The FSC also has recently issued guidelines on digital formats for insurance policy documentation. Furthermore, deposit rules for insurers is at its draft stage with the FSC and would require insurers to maintain a prescribed amount of about MUR 8 million at an approved financial institution by the Central Bank, in compliance with Section 24 of the Insurance Act.

The above implementations and structuring corroborates the dynamic nature and increasing growth of the insurance industry in Mauritius and calls for an in-depth assessment of factors that impact performance in the industry.

CHAPTER 3

CONCEPTUAL FRAMEWORK

3.1 INTRODUCTION

This section of the study discusses the concept of financial performance specifically profitability; its evolution and measurements. This section further presents brief reviews of concepts, definitions and existing theories which will enhance the understanding of the factors influencing financial performance. The section gives logical meaning to the variables considered relevant to the problem and guides the study accordingly. The concepts identified within the theoretical framework for the assessment of financial performance and its determinants are, Structure-Conduct-Performance theory, Agency theory, and Arbitrage pricing theory.

3.2 CONCEPT OF FINANCIAL PERFORMANCE

The concept of financial performance refers to the extent to which the financial goals of a company are being attained through various measurements and performance indicators, of which the most commonly used are accounting ratios. Financial performance reflects on the overall health of a company and allows for comparisons across sector, industry and at company level for business lines comparison.

The advantages of using financial measures includes the ease of calculation and also that definitions are agreed globally" (Almajali & Alomari, 2012, p6). Given that what constitutes financial performance is highly subjective, using profitability as the only measure of financial performance can be tricky since profit does not guarantee or equate high liquidity. This calls for firms' performance measurement to be analysed across multiple dimensions to capture efficiency, solvency, growth, liquidity, capital employed, asset base and market values amongst many.

Walker, (2001) argues that, evaluation of financial performance can be assessed using; market premium, profitability, and productivity. Malik, (2011) on the other hand, argues that profitability increases shareholders' wealth hence, it is an important financial performance objective. (Kasturi, 2006; Greene & Segal, 2004) believe insurers' financial performance is best measured by; underwriting profits, premiums earned, return on assets, annual income, turnover, and return on equity. In support of profitability Chen and Wong, (2004) proposed that, "higher profits provide

both the means (greater availability of finance from retained profits or from the capital market) and the incentive (a high rate of return) for new investment" and argues that profitability is the objective of financial performance.

Al-Shami, (2008) points out profitability, size and continuity of a company are some of the key performance indicators of a company. While size of a company is a measure of growth by the reinvestment decisions of ploughed back earnings and leverage, profitability is shows a company's ability to provide returns on investments and assets. Continuity on the other hand, is the ability to operate into the foreseeable future, even at a time when there is slow economic or industry growth.

For a general insurer, performance is said to be measured mainly across underwriting profits, which involves returns from the core operations of underwriting policies, investment profits from the investment activities of the insurer and net profit, which measures returns on total sales (Chen and Wong, 2004). The issue of the ideal measure of profitability, still remains arbitrary and subjective even though returns on assets (ROA), defined as the proportion of net profits to the total assets of the firm is considered one of the best and most used financial metrics in accounting supported in most literature (Russo & Fouts, 1997; Stanwicks & Stanwicks, 2000; Hardwick & Adams, 1999). The study measures financial performance as returns at both the operational level and net income level to corporate assets, using return on assets (ROA) and operating profit ratios, as described in relevant prior literature.

3.3 AGENCY THEORY

Ross, (1973) states that "an agency relationship is said to have arisen between two or more parties when one, designated as the agent, act for, on behalf of or as representative for the other, designated as the principal, in a particular domain of decision-making to solve problems". Essentially, agency theory is when one party acts on behalf of another in an agent-principal relationship, and it is mainly sustained through contractual agreements (Jensen & Meckling, 1976).

Mostly, "the determinants of the financial performance of financial services firms are often difficult to discern given the intangible nature of outputs" (Berger et al., 1997). Nonetheless, knowledge from relevant literature such as agency theory, provide insights which improves the understanding of the factors which influence the performance of financial institutions. Agency theory predicts that, contracts such as compensation and reward schemes, are used to keep the

interests of owners and managers aligned as organizational growth, leads to a separation between ownership and control.

From these insights, company performance is “predicted to be a function of the effectiveness of organizational specific contractual mechanisms for attracting, retaining and controlling managerial talent, in ways that maximize owners’ wealth” (Adams & Buckle, 2003). Thus, organisational economics points of view such as agency theory are amongst the many perspectives that help to explain the differences in the performance of companies given different levels of management talent.

3.4 ARBITRAGE PRICING THEORY

Qian, (2019) states that “the theory of asset pricing is concerned with explaining and determining prices of financial assets in an uncertain world”. Cummins (1990) posits that “insurance companies are corporations and that insurance policies can be interpreted as a specific type of financial instrument or contingent claim; hence it seems natural to apply financial models to insurance pricing”. Thus, the target rate of return from insurance underwriting and pricing decisions, like any other financial instrument, should be based on risk-return analysis proposed by various asset pricing theories such as the arbitrage pricing theory (APT) and the capital asset pricing model (CAPM).

This requires insurance models to estimate accurate and competitive prices and to avoid unguided price cuts, in order to create value for the firm. Hence financial pricing models should be one of the essential considerations by insurers, when making relevant reinsurance and policy pricing decisions.

Stephen Ross’ arbitrage pricing theory (APT) proposed in 1976 is a multifactor asset pricing theory, which implies that an asset’s return is linearly related to certain macroeconomic factors that represent market risk, represented by a risk or beta coefficient for each factor. The arbitrage pricing theory (APT) is considered a less restrictive and flexible form of the capital asset pricing model (CAPM). The arbitrage pricing theory (APT) has among its defining characteristics such as; “asset returns are generated by the linear factor model and that assets are priced to eliminate arbitrage opportunities in a competitive and frictionless market where investors hold well diversified portfolios” (Cummins, 1990).

Insurance is known to thrive on the benefits of the diversification effect, through the creation of pools which absorb risks. This is notwithstanding the fact that insuring a large number of people does not guarantee the absence of risk, given how unpredictable events such as natural disasters could be causing major insurance losses, by affecting large numbers from the insured pool simultaneously. Also, given that the study probes the effect of macroeconomic variables on insurers' performance will help insurers to understand their sensitivities to these variables. Thus, insurers will be able to better price these macro factors in their policy pricing, being guided by various useful asset pricing models available to the insurance industry.

3.5 MARKET STRUCTURE AND FINANCIAL PERFORMANCE

The structural developments and market dynamics by regulators and firms ultimately impacts an industry's market structure mostly by affecting pricing behaviours (Alhassan et al., 2015). In insurance, prices of policies or premiums reflect clients' riskiness and how prone clients are to the risk being covered by the policy. Thus, the more prone you are to a particular kind of risk, the higher the premium charged for a policy covering that risk. However, insurers' ability to correctly price premiums for the different classes of clients depends on various factors that inform such pricing decisions. Notable among these industry factors is the influence of the market power dynamics and market concentration on the pricing behaviours of companies. Notable amongst the theories which explain how market structure impact firms' financial performance are; the Efficient Structure (ES) hypothesis proposed by Demsetz in 1973, the Structure-Conduct-Performance (SCP) theory which was first proposed by Bain in 1951, and the Relative Market Power (RMP) hypothesis.

Berry-Stölzle, Weiss and Wende, (2011) posit that, within the S-C-P hypothesis "a decrease in the number of firms within a market may lead to collusion among firms" in setting higher prices, to achieve profits. Thus, Weiss, (1974) states that, market concentration enables collusive firm behaviours by lowering the cost of collusion which leads to higher economic rents for the few market players. Within the S-C-P hypothesis, prices are not favourable to the consumer, but it positively impacts on firms' performance in the form of profits (Stigler, 1964).

It is believed that, larger shares give firms market power relatively to firms with small market shares within the Relative Market Power hypothesis (Shepherd, 1986; Berger & Hannan, 1993).

Firms, by virtue of their position, earn economic rents because consumers mistakenly consider market power to mean quality products and services (Rhoades, 1985) and hence are willing to pay more under the Relative Market Power hypothesis.

Finally, the Efficient Structure hypothesis on the other hand, states that more efficient firms are able to charge competitive prices which helps them to increase their share in the market and in effect causes the market to be concentrated. The Efficiency Structure paradigm considers concentration to favour both consumers and firms because of the lower prices charged to consumers and consequently firms' greater ability to grow their market share and earn profits while doing so. Theoretically, the impact of market structure in terms of bigger market shares and higher industry concentration on financial performance is positive under both the Relative Market Power (RMP) hypothesis and the Structure Conduct Performance (S-C-P) hypothesis respectively. A negative coefficient for cost variables indicate insurer efficiency and favours the Efficiency Structure (ES) hypothesis by implying that, firms which operate at lower costs are more profitable.

3.6 DETERMINANTS OF PROFITABILITY

Although when it comes to financial accounting, the main factors of a company's profitability lie primarily in its revenue income and expenses, several other factors in turn, affect how much income a company makes and what expenditures are incurred to generate those levels of revenue. Buyinza et al., (2010) described these factors as firm specific, industry features and macro-economic variables. Similarly, Hicks, (2000), states that insurers have multiple sources of cash-flow besides premium income and hence depend on many external factors such as macro variables for their growth and survival.

Luçi, Kripa and Ajasllari, (2016) in their study on the Albanian insurance market found that about fifty-six percent (56%) of the variations in profitability by insurers could be explained by internal factors, indicating that the remaining forty-four percent (44%) was due to external factors. Thus, the performance of insurers is influenced by internal factors within the firm's control and management in the form of firm specific characteristics, along with external factors outside the control of the business in the form of industry and macro characteristics. Therefore, a comprehensive assessment of financial performance must consider different factors impacting

profitability at these three levels such as, firm size, age, inflation, capital structure, GDP growth rate, efficiency, market structure, interest rate, and many more.

Theoretically, we would expect factors that increase income or resources and firms that have operated for longer periods to positively correlate with profits. This is because firms with more resources and those that have been operating for longer periods are expected to be competitive, given their resource base and experience in the industry for the periods they have existed.

On the other hand, factors that contract or suggest an outflow of resource and firms operating for relatively shorter periods are expected to be less competitive and less experienced, hence having a negative relationship with profitability. Thus, high levels of factors with negative relationships reduce insurer profitability while a positive relationship increases insurer profitability (Luçi, Kripa & Ajasllari, 2016). In such cases, for example, growth in premium, one good performance indicator of insurer growth, allows insurers to take advantage of opportunities in the market with its strengthened position, hence improving profitability positively.

Again, one might assume that a factor such as high levels of liquidity will have negative association with profitability because, high levels of liquidity compromises investments. Thus, high levels of cash and investment in current assets are maintained and can expose insurer to insolvency risk and hence adversely impact insurer profitability. Most empirical literature have centred on company specific determinants such as, claims, liquidity, retention, size of company, age of firm, leverage, management expenses, and capital volumes amongst others and macro factors such as GDP, inflation, and interest rates.

3.7 SUMMARY OF CONCEPTUAL FRAMENWORK

This chapter has reviewed the concepts and theories which serve as the operational guide for the study in general and enhances the understanding of financial performance and its determinants. The section gives a general review of financial performance and its measurements from relevant literature, which served as a guide in choosing appropriate financial proxies for the study. The concept of financial performance explains the degree to which companies meet their financial goals and objectives as measured by different performance metrics. There are numerous ways of assessing the financial health of companies hence, the concept remains highly subjective. The

advantage of financial measures generally concerns the ease and acceptance of calculations and definitions respectively.

Furthermore, the concept of profitability as the main or only measure of financial health can be tricky and hence it is imperative that firms assess their financial health across multiple dimensions such as efficiency, solvency, liquidity, growth, market value and asset base, amongst other indicators, so as to avoid being myopic in our assessment. It was gathered from past studies that return on assets (ROA) remains one of the widely accepted and ideal metrics of profitability while others assessed performance of insurers mainly across the operational level. Given the nature of insurance business, the determinants of financial performance can be assessed at the micro; made up of firm specific variables, meso; which consist of industry factors and macro levels which capture factors affecting the general economy.

Under theoretical reviews, the study discussed the agency theory, arbitrage pricing theory and the Structure-Conduct-Performance theory. These theories help with understanding the relevance of internal and external determinants to the financial performance of insurers. Agency theory states that the principal agent relationship which exists between managers and owners of corporations are maintained by contracts. This helps to align the interests of both parties by ensuring management efficiency leads to maximization of owners' wealth. Also, the section reviewed the concept of market structure and its impacts, specifically the Structure-Conduct-Performance hypothesis (S-C-P) was discussed to determine the effect of market concentration on financial health of companies. According to Weiss, (1974) market concentration fosters collusion among firms in the market, since higher concentration lowers the cost of collusion, resulting in monopoly rents. Finally, the study briefly discussed the financial concept of asset pricing, specifically the arbitrage pricing model, which helps insurance companies to develop models to inform their pricing behaviours. This is given that insurance products could be considered as financial instruments. One main hypothesis of APT is that investors hold well diversified portfolios, and this is known to be one of the thriving forces behind insurance operations. Thus, insurers thrive on the benefits of diversification through the creation of pools to absorb their risks.

CHAPTER 4
LITERATURE REVIEW

4.1. INTRODUCTION

This section of the paper presents past empirical findings on the factors ascertained to impact performance directly or indirectly within the insurance sector and other closely related industries spanning different countries globally and across different periods.

4.2. EMPIRICAL FINDINGS

The empirical findings represent results and evidence of past studies conducted in different markets and over different scopes. The findings are categorized under firm specific determinants, macro determinants and market structure determinants.

4.2.1 FIRM SPECIFIC DETERMINANTS

Browne et al., (2001) found firm profitability to be positively associated with firm size, liquidity and bond portfolio returns. Datu, (2016) found significant impact for company size, financial leverage, input cost, reinsurance and underwriting risk on both return on assets (ROA) and operating ratio within the Philippine non-life insurance sector. Similarly, Lee, (2014) explored the effects of firm specific factors on return on assets (ROA) and operating ratio, in Taiwan's property-liability industry using a panel data study over the period 1999 to 2009. The findings show that factors such as; return on investment, underwriting risk, reinsurance usage, financial holding group, and input cost, significantly impact performance both in return on assets (ROA) and operating ratio. In addition, Hailegebreal, (2016) found profitability was negatively and significantly impacted by technical provision, leverage, and underwriting risk on performance, whereas premium growth, age and solvency had a positive relationship with profitability. Other factors with no significant effect on profitability included size of the company, re-insurance dependency, tangibility of assets, and liquidity.

Kripa and Ajasllari, (2016) showed that in Albania, factors such as liabilities, growth rate, fixed assets, and liquidity, were the determinants of insurers' profitability. Growth in premium positively correlated with profitability, while fixed assets, liquidity, and liabilities, were negatively correlated with profitability. Capital volume and size were statistically insignificant determinants of performance. In Albania, Çekrezi, (2015) ascertained a negative and significant impact of risk and

leverage on performance, whereas tangibility of assets impacted positively and significantly on return of assets (ROA). Like (Kripa & Ajasllari, 2016), Çekrezi, (2015) found no significant evidence to support a relationship between insurers' profitability and size of company in Albania. Boadi et al., (2013) on the factors which influenced profitability of insurance companies in Ghana, measured the impact of leverage, firm growth, liquidity, size, and risk on return on assets (ROA) and found that increases in liquidity, and leverage positively influenced return on assets (ROA). Almajali et al., (2012) identified the impact of liquidity, size, leverage, and management competency index to be positive and directly related to the financial performance of Jordanian insurers.

Munyambonera, (2013) used the cost efficiency model through a panel analysis, to ascertain bank profitability in Africa and found that both macroeconomic variables and bank specific factors explained the variations in commercial banks' profitability over the period from 1999 to 2006, based on two hundred and sixteen samples from forty-two countries. In the study Munyambonera found that, growth in deposit and capital adequacy positively impacted bank profitability, while the opposite was true for operational efficiency, growth in bank assets, and liquidity indicators. Mwangi and Iraya, (2014) within the Kenyan Insurance Market, found a positive relationship between investment yield, and assets while a negative relationship between expense ratio, and loss ratio and financial performance was also found. Retention ratio, growth of premiums, and size were found to be insignificantly correlated with financial performance of general underwriters in Kenya. Contrary to Mwangi and Iraya, (2014), Gonga and Sasaka, (2017) found, premium growth and size as significant factors affecting the profitability of insurance firms in Kenya using fifty-five listed firms.

Mwangi and Murungi, (2015) in Kenya provided empirical findings of the factors affecting insurers' profitability over the period 2009 to 2012. They found evidence to support a positive association between profitability with equity, leverage, and management competence. However, a negative relationship was identified for profitability with size of company, and ownership structure. Their studies further found no relationship between insurer profitability with underwriting risk, retention ratio, liquidity, and the age of insurers. Muya, (2013) found other factors which significantly impact insurance companies' financial performance in Kenya were

competition and insurer's liquidity. Thus, innovation and competitive prices charged by insurers in the face of competition and liquid investments determined the financial performance of insurers.

In their assessment of the non-life insurance market in Croatia, Pervan and Pavić, (2010) found a negative and significant relationship between expense ratio, ownership, and inflation on profitability. In addition, Curak et al., (2011) found company size, inflation, equity returns and underwriting risk, to have a significant relationship with the profitability of Croatian composite insurance companies.

Alomari and Azzam (2017) investigated for Jordanian insurance companies, the effect of micro determinants on the financial performance of insurers, using a panel data analysis from 2008 to 2014. The findings showed that, underwriting risks, liquidity, and leverage have a negative and significant effect on performance, while market share and company size, are statistically significant with positive effects on the profitability of Jordanian insurers.

Cummins and Nini (2002) investigated the optimal capitalization by 'property-liability' insurance companies and concluded that optimal capital to assets ratio are positively related to revenue efficiency, suggesting that large firms are rewarded with higher revenues. They further concluded that insurers are substantially over utilising equity and such an over utilization indicates inefficiencies that lead to financial performance penalties that are directly linked to this over utilization (Cummins & Nini, 2002).

Burca and Batrînca, (2014) found factors such as, financial leverage, company size, risk retention ratio, underwriting risk, growth in written premiums, and solvency ratios as the significant determinants of insurer profitability in Romania between the period 2007-2012.

Lee and Lee, (2011) described the determinants influencing Taiwan's property-liability insurer retention negatively to be, underwriting risk and premium growth while business concentration, inflation, liability to liquidity asset ratio, and interest rate, positively impact insurer retention in Taiwan.

In Ethiopia, regarding the performance of insurance companies from 2003 to 2011, Sambasivam and Ayele, (2013) found factors such as growth, size, liquidity, leverage, and capital, to be

significantly associated with return on assets (ROA), whereas the tangibility of assets and the age of a company were not significantly related with performance.

Malik, (2011) during the period from 2005 to 2009 empirically examined the effect of company specific factors on the return on insurers' assets (ROA) for both life and non-life samples in Pakistan and found no evidence to support a relationship between profitability and the age of insurer. However, he found a significantly positive association between profitability and volume of capital, and size of company. In addition, leverage ratios and loss ratios of insurers significantly and negatively influenced profitability of insurance companies in Pakistan. Naveed, Zulfiqar and Ishfaq (2011) found factors such as underwriting risk, size of company, and liquidity to be important determinants of the capital structure of life insurers in Pakistan proxied on leverage. They also, concluded on a negative relationship between profitability and leverage of life insurance companies.

Kwaning, Awuah and Mahama (2015) within the Ghanaian nonlife insurance sector, concluded that there was a negative correlation between insurer claims and return on assets (ROA), while a positive relationship was found between size, liquidity, leverage, gross written premium, and profitability. With all factors being deemed significant, liquidity was found to be the strongest predictor variable for non-life insurers' performance in Ghana for the period 2009 - 2013, with a sample of ten non-life insurers.

In the Bermuda insurance industry, Adams and Buckle, (2003) through a panel analysis, found that insurers with low liquidity and highly levered insurers have perform better operationally than highly liquid and low-levered insurers. They also found financial performance and underwriting risk to be positively related, while scope of insurer activities and company size and were found not to be important explanatory variables.

In Turkey, Kaya, (2015) empirically assessed the effect of firm factors on the profitability of non-life insurers and found evidence supporting, current ratio, premium growth, size, loss ratio, and age were the firm specific variables that impacted insurer profitability. Evidence points to a significantly positive relationship between insurer size, premium growth and profitability, while a negative and significant association was found between age, current ratios, loss ratio, and

profitability. However, no support was found for any relationship between profitability and premium retention.

Berteji, (2016) in Tunisia found size, premium growth, and age, regressed on return on assets (ROA) to be the significant factors of financial performance, while leverage, tangibility, liquidity and risk were statistically insignificant determinants in their study on the determinants of life insurers' performance. The empirical results described a positive impact of age, and premium growth on ROA while firm size negatively affected performance.

Charumathi, (2012) in India found that insurer specific factors such as, equity, underwriting risk, premium growth, leverage, size, and liquidity are the variables impacting insurer performance as measured by return on assets (ROA). The study concluded that there was a significant and positive influence of size and liquidity on ROA whereas they found that equity capital, premium growth and leverage were negatively and significantly correlated with ROA. However, the study did not find any evidence in support of a relationship between underwriting risk and profitability. Still in India, Daare, (2016) found that, capital adequacy was positively related to non-life insurers' profitability, while a negative association was found between liquidity and profitability. Wani and Dar, (2015) in their investigation of the effect of financial risks on the financial performance of Indian life insurers from 2005 to 2013 concluded that risks in the form of capital management, solvency, and liquidity together with size of the company and capital volume were the significant determinants of financial performance. However, their findings showed that financial performance was statistically insignificantly related to underwriting risk in the Indian life insurance industry.

Alhassan, Addison and Asamoah, (2015) in addition to the impact of market structure on insurer performance in Ghana identified factors such as; leverage, and underwriting risk, to be significant determinants of performance in both life and non-life markets, with pronounced impact of underwriting risk on nonlife insurers, relative to the life insurers, while larger life insurance companies were seen as more profitable than smaller insurers. Similarly, in Ghana, Akotey et al., (2013) described the impact of various factors on three metrics of insurer performance; net income, investment income, and underwriting profit. They identified a positive relationship in both insurers' net profit and underwriting profits, and gross written premiums while a negative impact of gross premium on investment income was recorded. Claims payments had a positive association with investment returns, which indicated the importance of high investment yields in periods of

high claims. Finally, claims negatively related to underwriting profits and total net profits. In addition, total assets and interest rates had a positive association with underwriting profits and net profit, while leverage had a positive relationship with investment income.

In investigating the factors which determine the performance of general insurance or non-life insurance companies' performance in the United Kingdom, Shui, (2004) used economic and financial returns panel data set over the period 1986 to 1999 to present evidence that, underwriting profits, and liquidity were the main drivers of non-life insurers' financial performance.

In the Tunisian life insurance market, Derbali and Jamel, (2017) examined the effect of company characteristics on the profitability of eight insurers and concluded empirically that, firm growth rate, age of company and company size were the important determinants of life insurers' performance in Tunisian as proxied by return on assets ratio (ROA). They further found leverage, liquidity, tangibility, and risk did not have significant effects on the financial performance of life insurers.

During Poland's integration into the European Union, Kozak, (2011) used nonlife sample pertaining to the period 2002 to 2009 to determine the factors which improved insurer profitability were; increase in gross written premiums, decrease in total operating expenses, and increases in market share in foreign owned companies.

Ezirim et al., (2017) presented evidence from the Nigerian insurance industry, and showed that premium ratio, investment ratio, and level of economic activity, were positively and significantly related to financial performance. They also found that, claims ratio and financial market conditions exerted negative and significant influences on insurer profitability.

Ghimire, (2013) assessed the financial efficiency of the non-life industry in Nepal and concluded on a sound industry financial performance measured by the improvements in the position of expenses, return on assets, gross premium to equity, return on equity, retention, net premiums to equity and return on capital ratios. The study also found that, although there was a general boost in performance, investment ratios were seen as deteriorating with fluctuations in claims and combined ratio during the period under review from 2007 to 2011.

4.2.2 MACRO DETERMINANTS

Datu, (2016) on the assessment of the impact of macroeconomic characteristics on insurer profitability, found no evidence to support an association between GDP, inflation and profitability proxied on both return on assets (ROA) and operating ratio. Similarly, Lee, (2014) in his economic assessment in Taiwan found no evidence to support a significant impact of economic growth rate on return on assets (ROA) but on the contrary found a significant impact of economic growth rate on the operating ratio model.

Hailegebreal, (2016) and Daare, (2016) both found GDP and performance to be positively related whereas inflation and profitability were negatively associated in the Ethiopian insurance market and Indian insurance markets respectively.

Munyambonera, (2013) in his study on bank profitability in Africa determined the relationship between GDP and increase in inflation with banks' profitability to be negatively related.

Murungi, (2014) explored the effect of macro-economic variables on the profitability of insurance companies in Kenya from 2007 to 2013, with a sample of forty-six listed insurance firms - and found GDP, interest rate, Expense ratio, and claim ratio statistically significant, while inflation rate, real exchange rate, money supply and size of assets proved statistically insignificant and revealed the ability of interest rate and GDP to predict insurance companies' performance.

Muya, (2013) also in Kenya, used descriptive survey design and a sample of forty-six insurance companies to conclude empirically, that fluctuations in interest rates affected insurance companies in two directions; insurer borrowings and insurer investments.

Gikungu, (2012) studied the macroeconomic determinants of the financial performance of listed firms in Nairobi. The findings of the study showed that, stock prices positively and significantly correlated to money supply and inflation for all fifty-nine listed companies in 2012. Exchange rate was found to be negatively and significantly related to share prices while an insignificant negative relationship was found for the impact of interest rates on share prices.

Macfubara et al., (2018) found that monetary policies such as, interest rate, treasury bill rate, exchange rate, and money supply, moderately affected the return on equity of insurers in Nigeria, by adopting a time series study on the impact of monetary policies on equity returns of listed insurers. All explanatory variables except the treasury bill rate were positively related to equity

returns and confirmed the fact that macroeconomic variables indeed impact performance of insurance businesses.

Alomari and Azzam (2017) found GDP to be positively related to insurer performance while inflation on the other hand was found to have no significant influence on insurers' performance in Jordan.

Shui, (2004) also concluded that interest rates, and inflation were significant determinants of financial performance for non-life insurers in the United Kingdom.

Lambe, (2015) determined the influence of exchange rate on Nigerian banks and ascertained a positive relationship between bank profit and exchange rate and a negative relationship was found between interest rate, inflation and bank profitability. Kozak, (2011) found growth in GDP to improve non-life insurer profitability in Poland from 2002 to 2009.

Hussain, (2015) in his study on macro economy and profitability of insurers in Pakistan found supporting results on the effect of macro variables on profitability. The findings showed that macroeconomic variables, stock market conditions and inflation positively and significantly impacted insurer profitability in Pakistan.

Doumpos et al., (2012) empirically estimated that macro conditions such as income inequality, GDP growth, and inflation rate were significant predictors of financial performance in the non-life markets, with a sample of 2176 firms in ninety-one (91) countries for the period 2005 to 2009 through an unbalanced panel of 9181 observations.

Grace and Hotchkiss, (1995) provided evidence of a long term link between underwriting performance proxied by combined ratio and the economy measured by GDP, interest rate and inflation rate, using quarterly data from 1974 to 1990.

4.2.3 MARKET STRUCTURE DETERMINANTS

Within the United States from 1992-1998, Choi and Weiss (2005) tested the Structure-Conduct-Performance theory (S-C-P), efficiency structure theory (ES) and the relative market power hypothesis (RMP) and found evidence in support of the efficiency structure (ES) hypothesis in their investigation into the relationship between financial performance and market structure and

efficiency by property liability insurers. They further posit that cost-efficient firms charged competitive prices to earn abnormal profits, in accordance with the efficient hypothesis, while revenue-efficient firms charged higher prices to earn abnormal economic rents (Choi and Weiss, 2005).

Again, in the US health insurance market at state levels, Cole, He, and Karl (2015) found empirical evidence to support the positive relationship between profitability and market concentration, even though such relationship could not be attributed specifically to efficiency or anti-competition among health insurers. Insurers operating in states with higher market concentration were found to be profitable than insurers operating in less concentrated states.

In Europe, within the property-liability industry, Berry-Stölzle et al., (2011) empirically assessed the impact of market structure and efficiency on insurer performance. They presented findings which strongly lend support to the efficient structure hypothesis, with little or no support for the structure-conduct-performance and relative market power hypotheses. The results were achieved using a panel analysis comprising twelve (12) countries in Europe during from 2003 to 2007.

Alhassan, Addison & Asamoah (2015) in their study on the impact of the Ghanaian market structure and its efficiency on profitability, concluded from their empirical results, a support for the efficiency structure hypothesis for both life and non-life sectors. Mixed results were found for the structure- conduct performance (S-C-P) hypothesis in the non-life sector and rejected in the life sector. They however, pointed out the existence of competition in the presence of concentration, with the life insurance sector found to be more efficient relatively to the non-life sector.

Pope and Ma (2008), in their empirical studies on market structure which assessed the performance relationships in the international non-life insurance sector, tested the structure conduct performance hypothesis (S-C-P) over the period 1996 to 2003 and found supporting evidence for the S-C-P hypothesis, when levels of liberalization were lower. Thus, their findings showed that markets with high barriers of entry for foreign competitors facilitated collusive behaviour from concentrated marketplaces. They further proved that weak evidence existed in support of the S-C-P hypothesis in markets with increased liberalization or markets that allowed new entrants to come in.

Bajtelsmit and Bouzouita (1998) determined the impact of market structure on financial performance for automobile insurance companies in the United States for the pertaining to 1984

to 1992. The findings showed a positive association between market concentration and profitability of insurers in the automobile market.

4.3 SUMMARY OF LITERATURE

This chapter reviewed past studies on the effects of company specific characteristics, industry factors and macroeconomic determinants of the financial performance of the various insurance markets globally spanning Europe, Africa, United States and Asia, with the objective of understanding the direction and gaps in literature.

In the review of empirical studies, (Akotey et al., 2013) identified the relationship between gross written premiums with both insurers' sales profitability and underwriting profits as positive, while it negatively impacted investment income. Daare, (2016), found the relationship between GDP, capital adequacy and profitability to be positive correlated while a negative association was found between liquidity, inflation and profitability in the Indian non-life insurance market. In Turkey, Kaya (2015) presented evidence which pointed to a significantly positive relationship between size, premium growth and profitability, while a significant and negative association was found between age, loss ratio, current ratios and profitability.

Alhassan, Addison and Asamoah, (2015) concluded with empirical evidence in support of the efficiency structure hypothesis for both insurance markets in Ghana. While they found conflicting results for the structure- conduct performance (SCP) hypothesis in the non-life sector, it was rejected in the life sector. Berry-Stölzle et al., (2011) likewise found strong support for the efficient structure hypothesis with little or no support for the structure-conduct performance and relative market power hypotheses.

Murungi, (2014) found interest rate, and GDP as significant macro factors while inflation, exchange rate, and money supply were insignificant revealing the ability of interest rates and GDP to predict insurance companies' performance in Kenya. Adams and Buckle, (2003) found a positive correlation between highly leveraged, low liquidity insurers and reinsurers and operational performance while the reverse was the case for low leveraged, highly liquid and direct insurers in Bermuda. They also found financial performance to be positively associated with underwriting

risk, while size and scope of company's activities were found not to be important explanatory factors.

The literature review found a gap in Mauritius as most of the empirical studies on factors that determine the performance of Insurance companies have focused on internal or firm specific factors with relatively few touching on the effects of external factors such as market structure, and macroeconomic variables simultaneously. It can be concluded from the review that, the factors affecting performance remain inconsistent as their impacts vary across countries, regions and markets and most importantly across the different insurance markets. This current study therefore narrows the gap, by empirically establishing how firm specific factors (firm size, reinsurance ratio, combined ratio, leverage, and gross written premiums) industry factors (market structure) and macroeconomic variables (GDP growth, foreign exchange and inflation) relate to the financial performance of insurance companies in Mauritius.

CHAPTER 5

DATA AND METHODOLOGY

5.1 INTRODUCTION

This section introduces the type and sources of data, sample and population, definitions and measurements of variables, the empirical model employed, model specification, and robustness checks for model validity.

5.2 TYPE AND SOURCE OF DATA

The study used mainly secondary data collected from the World Bank and the Financial Services Commission (FSC), the regulatory body of insurance businesses in Mauritius. The study sourced mainly macroeconomic variables from the World Bank and all annual financial statements from the FSC.

5.3 POPULATION OF THE STUDY

The study covered mainly long-term insurance business and general insurance business in Mauritius, spanning the period 2008 to 2016, for a total of twenty non-life insurance companies and seventeen life insurance companies.

The study used the population of all companies that reported to the FSC during the period under review, due to the small size of the population and discrepancies in reporting.

5.4 MEASUREMENT OF VARIABLES

Profitability for both life and non-life insurance companies were measured by two dependent variables in this study. The two dependent variables were return on assets (ROA) and underwriting profit ratio (UWPR).

The internal and external independent factors assessed in the study to determine their impact on insurers' financial performance included: size, total assets, gross written premiums, market structure, combined ratio, leverage, GDP growth, inflation and foreign exchange, as outlined below.

5.4.1 DEPENDENT VARIABLES

RETURN ON ASSETS (ROA): Return on Asset is measured as the ratio of profit before tax to total assets of the insurance company. ROA is one of the dependent variables in this study, used to measure the financial performance of insurance companies in Mauritius. It measures the overall revenue generated by insurance companies deploying the companies' assets. ROA was used as a proxy for performance due to its constant use by most similar studies as a suitable and widely accepted measure for financial performance (Russo & Fouts, 1997; Stanwicks & Stanwicks, 2000; Hardwick & Adams, 1999).

UNDERWRITING PROFIT RATIO (UWPR): The underwriting profit ratio assesses the performance of insurance companies, considering income from its key operational business of underwriting activities. In this study, underwriting profit ratio is measured as underwriting profit to total assets. Thus, this shows how well insurance companies are able to use their assets to generate profits from their core operational mandates.

5.4.2 INDEPENDENT VARIABLES

SIZE (LTA): In most relevant literature and similar studies, size is used as a measure of total assets for insurance companies. In this study, size of insurers in Mauritius for both life and non-life markets is measured by the natural logarithm of total assets. The process of "logarithmic transformation is necessary to eliminate the effect of extreme values in the data" (Adam & Buckle, 2003).

In general, firm response and adaptation to changes in market conditions are believed to be based on their asset sizes. The general expectation and implication is that, bigger and larger firms are able to manage positive and negative market changes better and more rapidly, compared to smaller firms. Thus bigger firms are able to take advantage of favourable market changes and also minimize risk from unfavourable market changes.

In terms of competition, smaller firms may have less market power and hence be unable to compete with larger firms (Almajali et al., 2012). Similarly, Shui (2004) argued that "major insurance companies are expected to respond quickly to changes in the market conditions when compared with small companies." Thus they are able to handle and diversify risks effectively and can employ more skilled labour and also benefit from economies of scale with respect to cost of labour.

However, a different school of thought equally supported by economists and backed by relevant literature such as the agency theory, is the problem of inefficiency encountered as firms become bigger (Almajali et al., 2012).

Thus, according to Adam & Buckle, (2003) the problem of inefficiency occurs because "as organizations grow, it often becomes more difficult for owners to efficiently and effectively monitor and control aberrant behaviour of managers."

The theory of size and firm's financial performance is equivocal and remains unclear until it can be investigated for specific cases.

LEVERAGE RATIO (LEVR): Leverage is another relevant variable that has been investigated in most of the literature for its impact on the financial performance of insurance companies. Akotey et al., (2013) defined insurance firms' leverage as "comprising unearned premiums, contingency reserve or life fund, outstanding claims, deferred tax, unpaid dividends, trade and other payables."

In this study, leverage ratio is measured as a ratio of total liabilities to total assets. The ratio is used to eliminate the effect of unequal firm sizes among the companies under review. Inferring from the capital structure theory of firms, leverage is not necessarily a bad thing, but excessive leverage could harm a firm and drive a firm into insolvency challenges.

Thus, "capital structure literature suggests that firm's value increases with increased leverage up to an optimum point and then declines as leverage extends beyond this optimum level" (Carson & Hoyt, 1995).

However, Alhassan et al., (2015), states that the quality of investments generated using leverage determine the impact of leverage on profitability. This relinquishes the impact of leverage on profitability to the ability of firms to turn over their unearned premiums and life funds through investments to profitable income earning assets.

Thus, the relationship between leverage and profitability remains equivocal since the outcome can become positive through good investment decisions and vice versa from bad investment choices. This needs to be investigated for specific cases.

GDP GROWTH (GDPG): Gross Domestic Product (GDP) is a widely used and accepted measure of the volume of economic activities in a country. The GDP growth rate generally drives demand for goods and services and also reflects the state of the economic cycle (Mwangi, 2013). Increasing GDP growth is expected to drive demand for insurance products by businesses and households. Hence GDP is generally expected to impact profitability positively through growth in premium income as the economy improves and consumers spend more on insurance products (Alhassan et al., 2015).

INFLATION RATE (INFR): The persistent and continuous rise in the general price levels for goods and services could have both positive and negative impact on profitability, depending on the insurer's main source of income. On the investment side of business, firms stand to gain from inflationary pressures arising out of increases in interest rates all other things being equal. However, a negative relationship can be expected between inflation and the sales side of business, since inflation has a negative effect on real incomes, and hence reduces the purchasing power of consumers of insurance products (Alhassan et al., 2015). This leads to decreased sales and ultimately causes a negative effect on profitability, when holding all income sources constant. Inflation was measured as the annual percentage change in consumer price index and sourced from the World Bank.

COMBINED RATIO (CRA): In this study, combined ratio is used as a measure of efficiency for insurance companies in Mauritius. Combined ratio is measured as the sum of all incurred losses and expenses as compared with earned premiums. Losses and expenses included are claims, management expenses and commissions paid. The impact of combined ratio is shown in how effectively firms manage insurance risks and expenses and how commensurately high costs expended lead to increase efficiency in operations or in investment decisions that generate positive returns.

This ratio assesses how insurers manage cost to income and hence leads to a hypothesis that insurers with higher ratios are cost ineffective and hence less profitable, with a negative association with profitability and vice versa.

The combined ratio is calculated as follows:

Combined ratio = $\frac{incurred\ losses+expenses}{Earned\ premiums}$

GROSS WRITTEN PREMIUM (LGWP): Gross written premium is a key operational source of revenue for all insurance companies. The impact of premium growth on profitability can be generally accepted as positive. In this study, gross written premium is measured as the natural log of gross written premium, again, to avoid effect of extreme values in the sample.

REINSURANCE RATIO (RIR): Reinsurance comprises risks transferred from insurance companies to other third parties. Thus, "the insurance provided to insurance companies is expressed as reinsurance" (Kaya, 2013). Insurance companies sometimes depending on the amount of individual risks underwritten plays it safe by transferring part of these risks to reinsurers. The study measures reinsurance dependence as the amount of reinsurance ceded to gross premiums written. "Although reinsurance improves the stability of the insurance company through risk dispersion, achievement of solvency requirements, risk profile equilibration and growth of the underwriting capacity, it involves cost" (Burca & Batrinca, 2014). It is a general accounting rule that outflows that reduces revenue impact profitability negatively, as hypothesized in this study.

However, other studies found no relationship between reinsurance and profitability, which leaves room for specific case investigation, depending on the location of the insurance market. This is because different geographical locations respond differently to unexpected events that cause huge losses. This can dictate the level of reinsurance that firms cede, which in turn, determines the level of impact on profitability.

MARKET SHARE (HHI): This study applied the empirical theory of Structure-Conduct-Performance (S-C-P), for which market concentration was proxied on the Herfindahl Hirschman Index (HHI). HHI is a measure of concentration applicable in many contexts such as market concentration. Rhoades (1993) states that, the HHI is "useful in analysing horizontal mergers because such mergers affect market concentration" which evidence points to as an important determinant of market structure and competition.

The HHI accounts for the number of firms in an industry and shows their relative market sizes, by squaring their market shares and summing the squares for all firms in the market as follows:

HHI = $\sum_{i=1}^{n}(MSi)^2$ where; MS is market share

MS= $\frac{Insurer's\ premium}{gross\ industry\ premium}$

The equation above suggests that HHI increases as the number of companies or market players decrease, resulting in the concentration of industry. Another good indicator of market concentration is the 4-firm concentration ratio (CR4) suggested by Scherer & Ross, (1990). The 4-firm concentration ratio (CR4) is popularly used to "measure the degree to which a few dominant firms within an industry account for greater portions of the economic activities within that market" (Alhassan et al., (2015).

The study measured the 4-firm concentration ratio (CR4) for the purpose of industry analysis and comparison with the Herfindahl Hirschman Index (HHI) to provide strong evidence of the presence of concentration in the Mauritian Insurance industry.

Generally, a positive association between market concentration and firm profitability is expected. This is because like firm size, a good market position in terms of larger shares helps firms to better manage their expenses, grow their capital, improve on innovation and their corporate branding, which are all benefits from having market power (Burca & Batrinca, 2014). However, the higher the Herfindahl Hirschman Index, the higher the concentration and vice versa.

FOREIGN EXCHANGE (FX): Harvey, (2012) describes foreign exchange as the worth of one currency in comparison with another currency. Thus, foreign exchange is the rate at which another currency is purchased using another currency.

This variable is important for firms that need to convert currencies for the purposes of reporting, and conversion of investments abroad into local currency and vice versa.

This is because foreign exchange volatility impacts cash flows and ultimately affects the bottom line of profitability. Also, an understanding of foreign exchange risk is critical to the valuation of a company and the overall risk management within a company (Martin & Mauer, 2003).

In light of this, the risk inherent in foreign exchange can impact profitability positively or negatively, depending on the trend; either depreciating or appreciating. Foreign exchange in prior literature is measured as the real exchange rate of one's currency to the US Dollar.

In this study, foreign exchange thus follows prior studies and is measured as the real exchange rate of the Mauritius Rupee to the US Dollar (MUR/USD). The summary of the definition of variables is presented in Table 3 below.

Table 3: Summary of variable definition

Abbreviations	Variable Name	Definition/ Measurement	EXPECTED SIGN	
DEPENDENT VARIABLES			**ROA**	**UWPR**
ROA	Return on Assets	Profit before tax divided by total assets of insurance company (*i*) at time (*t*)		
UWPR	Underwriting profit Ratio	Underwriting profit divided by total assets of company (*i*) at time (t)		
INDEPENDENT VARIABLES				
LGWP	Gross written premium	Natural logarithm of gross written premiums by company (*i*) at time (*t*)	+	+
RIR	Reinsurance Ratio	Reinsurance ceded divided by gross premiums of company (*i*) at time (*t*)	-	-
LEVR	Leverage Ratio	Total liabilities divided by total assets of company (*i*) at time (*t*)	+	+
LTA	Size of company	Natural logarithm of total assets of company (*i*) at time (*t*)	?	?
CRA	Combined ratio	Incurred losses and expenses over earned premium for company (*i*)at time (*t*)	-	-
HHI	Herfindahl Hirschman index	Sum of the squares of the market share of companies at time (*t*)	?	?
GDPG	Gross domestic product growth rate	Annual percentage change in GDP at time (*t*)	+	+
INFR	Inflation rate	Annual percentage change in consumer price index at time (*t*)	-	-
FX	Exchange rate	Real exchange rate MUR/USD at time (*t*)	?	?

5.5 ESTIMATION APPROACH

This study employed panel data analysis techniques to investigate the effect of factors under consideration that impact insurer profitability. Panel data analysis is an analysis of datasets in which the behaviour of entities (countries, states, individuals, companies) are observed across time (Torres-Reyna, 2007). A panel data set can be balanced or unbalanced, depending on whether there is a full data set across all entities and across the same time period. In this study, the panels are

considered unbalanced due to the unavailability of data for some companies over the period under review, in both the life and non-life samples.

Panel data analysis can be estimated using different models such as the fixed effect model, the random effect model, pooled OLS regression, the first difference estimator and the between model. These models are estimated differently, "based on the assumptions made about the intercept, regression coefficients and the error term" (Kaya, 2015).

The study adopted the widely applied models, which included pooled OLS regression, the random effect model, and the fixed effect model. The pooled OLS regression estimated through the OLS methodology, denies the heterogeneity or individuality that may exist among the different insurance companies and assumes all insurers to be the same. In so doing, it estimates a common constant for all cross-sections, which is considered restrictive and calls for the inclusion of fixed and random models (Asterious & Hall, 2007).

Ahiawodzi and Sackey (2010) state that, the fixed effect model explains the association between the dependent and independent variables within an entity and assumes that, the variables which do not change with time are held constant. Thus, the fixed effect technique removes the effect of unchanging factors across time and shows only the net effect of the explanatory variables on the outcome variables Torres-Reyna, 2007). "The rationale behind the random effect model is that, unlike the fixed effects model, the variation across entities is assumed to be random and uncorrelated with the predictor or independent variables" (Torres-Reyna, 2007). It is worth noting that, "the crucial distinction between fixed and random effects is whether the unobserved individual effect embodies elements that are correlated with regressors in the model, not whether these effects are stochastic or not" (Greene, 2008).

In Baltagi, (2005), the panel data regression model takes the general form of;

$$\mathbf{y}_{it} = \boldsymbol{\alpha} + \boldsymbol{x}'_{it}\boldsymbol{\beta} + \boldsymbol{u}_{it} \quad i=1\ldots N,\ t=1,\ldots T, \quad u_{it} = \mu_{it} + \nu_{it} \qquad \textbf{(1)}$$

with *I* denoting the cross section, which represents the number of insurance firm, and *t* denotes the time series which represents time or year. $\boldsymbol{u}_{it}$ is generally considered the error term consisting of $\boldsymbol{\mu}_{it}$, *w*hich denotes the unobservable individual-specific effect and $\mathbf{v}_{it}$ denoting the remainder of

disturbance. ***X*** denotes the independent variable which serve as inputs and **β** is the regression coefficient of independent variables, where **α** is the intercept and ***Y*** is the output.

5.6 SPECIFICATIONS OF THE MODEL

The empirical models estimated for the measures of insurer performance are proxied on Return on Assets (ROA), which is the profit before tax returned to total assets and underwriting profits ratio (UWPR), which is the profits from the insurers' core operations from underwriting policies other than investment activities. The macroeconomic factors investigated are: inflation rate (INR), gross domestic product growth (GDPG) and real exchange rate (FX). The firm specific determinants as hypothesized include: leverage (LEVR), size (LTA), gross written premiums (LGWP), Efficiency proxied by combined ratio (CRA) and Reinsurance dependence (RIR). Industry factors hypothesised include market structure proxied by the Herfindahl Hirschman Index (HHI). The models developed to assess the impact of firm specific, industry and macroeconomic variables on return on assets (ROA), and underwriting profit ratio for both life and non-life insurance markets in Mauritius are developed in equations (2), (3), (4) and (5), respectively.

Model I Life insurers:

$$ROA_{i,t} = \alpha_{\mathrm{i}} + \beta_1 RIR_{i,t} + \beta_2 LTA_{i,t} + \beta_3 LEVR_{i,t} + \beta_4 CRA_{i,t} + \beta_5 HHI_t + \beta_6 \mathrm{GDPG}_t + \beta_7 FX_t + U_{i,t} \quad \textit{(2)}$$

Mode lI Life insurers:

$$UWPR_{i,t} = \alpha_{\mathrm{i}} + \beta_1 RIR_{i,t} + \beta_2 LTA_{i,t} + \beta_3 LEVR_{i,t} + \beta_4 CRA_{i,t} + \beta_5 HHI_t + \beta_6 \mathrm{GDPG}_t + \beta_7 FX_t + U_{i,t} \quad \textit{(3)}$$

Model I Non- Life insurers:

$$ROA_{i,t} = \alpha_{\mathrm{i}} + \beta_1 RIR_{i,t} + \beta_2 LGWP_{i,t} + \beta_3 LEVR_{i,t} + \beta_4 CRA_{i,t} + \beta_5 HHI_t + \beta_6 \mathrm{GDPG}_t + \beta_7 FX_t + U_{i,t} \quad \textit{(4)}$$

Model II Non- Life insurers:

$$UWPR_{i,t} = \alpha_{\mathrm{i}} + \beta_1 RIR_{i,t} + \beta_2 LGWP_{i,t} + \beta_3 LEVR_{i,t} + \beta_4 CRA_{i,t} + \beta_5 HHI_t + \beta_6 \mathrm{GDPG}_t + \beta_7 FX_t + U_{i,t} \quad \textit{(5)}$$

Where *i* is the cross-sectional index for insurance companies and *t* is the time index for the years under review (t=1,…N), β_k is the regression coefficient of the explanatory variables(k=1,…7). ROA measures return on Assets, RIR represent the reinsurance dependence, LGWP measures gross written premium, LTA measures total size of assets, HHI is the Herfindahl Hirschman index, GDPG is the gross domestic product growth rate, FX represents the foreign exchange rate and U measures the disturbance error term.

5.7 ROBUSTNESS OF MODEL

The study adopts various robustness tests to improve the validity of results and to reduce biases. The Pearson correlation matrix was adopted to test for multicollinearity between the explanatory variables. Coefficients exceeding plus or minus 0.7 between any two independent variables were assumed to be serially correlated and one of the variables was dropped in the final modelling. The arbitrary elimination of highly correlated variables is guided by Dohoo et al., (1996) argued that multicollinearity is certainly present with correlation coefficients of 0.9 and above and states that the choice of correlated variables to drop is subjective.

A test for serial correlation or autocorrelation and heteroskedasticity was employed, due to the time series component of panel data set. The Breusch-Godfrey/Wooldridge test for serial correlation in panel models and the Breusch-Pagan test for heteroskedasticity were adopted by the study. In the presence of heteroskedasticity and autocorrelation, the use of the sandwich estimator by (Eicker, 1963; White, 1980) was employed to achieve heteroskedasticity-consistent estimations which provide robust results, with corrected standard errors. The study also assessed the validity of panel regression models by testing the significance of the F-statistic and Chisq in each model at the five percent (5%) level.

CHAPTER 6

RESULTS

6.1 INTRODUCTION

This chapter presents results of the empirical models and techniques of panel data analysis applied to answer the objective of the research which is to identify the determinants of the financial performance of insurance companies in Mauritius for both the life and non-life markets.

Data obtained from the financial services commission of Mauritius was analysed, using descriptive statistics, correlation analysis and multiple linear regressions to answer the objective of the study using R software. Results are presented in the form of summary tables.

6.2 DESCRIPTIVE STATISTICS

The data of twenty non-life or general insurance business companies and seventeen life or long-term insurance companies who reported to the Financial services commission (FSC) for the period under review were brought together to obtain an unbalanced panel data set of a total of one hundred and twenty-two and ninety-eight firm-year observations for non-life and life insurers, respectively. Descriptive statistics of the variables to be analysed are presented in Table 4.

The results indicate that the average return on assets in both life and non-life markets is positive and indicates that overall, performance of insurance companies in Mauritius, like the general economy is profitable. The average return on assets in the non-life industry slightly exceeds that of life industry by one percent (1%).

Thus, five percent (5%) and four percent (4%) average returns on assets were recorded for non-life and life insurance industries, respectively. While a positive average operational performance is recorded in the non-life market in their underwriting profit ratio, the reverse is the case for the life industry, with negative average underwriting profit ratios.

The mean underwriting profits ratios recorded are minus two percent (-2%) and one percent (1%) for life and non-life industries respectively. Some reasons for the poor underwriting performance of life insurers on average could be that it is a result of poor premium pricing from unhealthy competition or excessive insurance risks from high claims and increased operational expenses. The ranges of return on assets for both industries recorded are minus thirty-three percent (-33%) to

thirty-seven percent (37%) and from minus thirty-two percent (-32%) to twenty-two percent (22%) respectively, for life and non-life industries. The underwriting profit ratio ranged from minus twenty-seven percent (-27%) minimum to a maximum of twenty-two percent (22%) in the life insurance sample and a range of minus thirty-three percent (-33%) minimum and a maximum of sixteen percent (16%) for non-life sample.

The Herfindahl Hirschman index (HHI) measuring market structure was recorded as 0.2814 as the minimum and 0.3706 as the maximum, with an average of 0.3265, representing the market structure dynamics of the life insurance industry. The HHI index starts at one (1) to ten thousand (10,000) or converting to a ratio form starts at (0.0001 to 1).

The interpretation with respect to market structure is that, one (1) represents a least concentrated industry and ten thousand (10,000) indicates a monopolistic and very concentrated industry, with one or a few players.

The United States Department of Justice in enforcing the antitrust laws and ensuring that markets remain competitive considers HHIs ranging from fifteen hundred (1500) to twenty-five hundred (2500) as fairly concentrated while industries with HHIs exceeding twenty-five hundred (2500) are known as highly concentrated. Inferring from these guidelines, the life insurance industry in Mauritius can be considered highly concentrated with few players.

The high HHI recorded explains the situation in the life industry of Mauritius with very few players remaining as at 2016, during the period under review.

As at 2016, only seven life insurance companies out of the seventeen from 2008 were functional and reporting to the FSC. This explains the high average concentration of 0.3706, using the HHI corroborated by ninety-three percent (93%) concentration ratio by the top four insurers, using the CR4 measure. On the one hand, the non-life industry recorded a moderate concentration with HHI of 0.1250 minimum and 0.1832 maximum, with an average of 0.1559.

The evidence of this result support the number of fifteen firms still operational as at 2016, compared to twenty firms for the period under review. Also, the four firm concentration ratio shows that the top four companies in the non-life industry account for about seventy percent (70%), on average.

As a minimum, about 0.34 of life net premium is used to settle claims and expenses, given the combined ratio indicator shown in Table 4, with a maximum of 3.8 and an average of 1.3. On average, life insurers' net premium is not enough to cover losses and operational expenses, indicating that life insurers depend on other sources of income to cover their losses and expenses. On average, non-life insurers' combined ratio is 3.23, also indicating insufficient income from premiums to cover claims and operational expenses. The range of combined ratio for nonlife represents outliers, due to new registered firms who ceded all their premiums to reinsurance or recorded low earned net premiums as shown in Table 4. On average, life insurers cede six percent (6%) of premiums, as reinsurance and an average of thirty-one percent (31%) reinsurance is ceded in the non-life industry.

Gross written premium measured by natural logarithm of gross premium values ranged from 7.9 to 15.9 for life and from 7.9 to 14.7 in non-life, with averages of 12.1 and 12.4 for life and non-life samples respectively. Size of company measured by the natural logarithm of total assets ranged from 10.7 to 17.5 and averaged 14.1 in the life industry and a range of 9.3 to 15.2 and an average of 13.2 in the non-life industry.

Leverage ratio measured as a fraction of total assets averaged 0.93 and 0.59 in life and non-life, respectively. The life industry's leverage ratio was higher because life fund and reserves constituted a major portion of total liabilities. Over the period under review, GDP growth averaged four percent (4%) and ranged from three-point three percent (3.3%) minimum to five-point four percent (5.4%) maximum. This explains the yearly economic growth recorded in Mauritius and reflecting on all industries. The inflation rate averaged three-point eight percent (3.8%) and ranged from naught point ninety-eight percent (0.98%) to nine-point seven percent (9.7%), indicating that Mauritius has enjoyed single digit inflation throughout the period under review. The foreign exchange rate of the Mauritian rupee to the United States dollar averaged 31.32 and ranged from 28.45 to 35.54 maximum for the period 2008 to 2016. The results indicate varying standard deviations for the various variables under examination. The results for both life and non-life industries show that firm specific, industry factors and macroeconomics factors are differently dispersed around their means from Table 4.

Table 4: Descriptive statistics of life and non-life sample

Life insurance						
Variables	**OBSERVATIONS**	**MIN**	**MAX**	**MEAN**	**MEDIAN**	**STD DEV**
ROA	98	-0.33	0.37	0.04	0.06	0.10
UWPR	98	-0.27	0.22	-0.02	-0.01	0.06
HHI	153	0.28	0.37	0.33	0.33	0.03
CRA	98	0.34	3.78	1.27	1.10	0.61
RIR	98	0.00	0.36	0.06	0.05	0.06
LGWP	98	7.95	15.92	12.08	12.29	2.32
LTA	98	10.68	17.52	14.10	14.12	2.27
LEVR	98	0.64	1.03	0.93	0.96	0.09
GDPG %	153	3.32	5.39	3.89	3.75	0.62
INF %	153	0.98	9.73	3.84	3.22	2.58
FX	153	28.45	35.54	31.32	30.70	2.37
Non-life insurance						
ROA	122	-0.32	0.22	0.05	0.06	0.07
UWPR	122	-0.33	0.16	0.01	0.02	0.06
HHI	180	0.13	0.18	0.16	0.17	0.02
CRA	122	0.00	198.58	3.23	1.04	18.68
RIR	123	0.04	1.00	0.31	0.20	0.24
LGWP	122	7.92	14.69	12.43	12.39	1.27
LTA	122	9.33	15.24	13.17	13.10	1.21
LEVR	122	0.14	1.19	0.59	0.57	0.16
GDPG %	180	3.32	5.39	3.89	3.75	0.62
INF %	180	0.98	9.73	3.84	3.22	2.58
FX	180	28.45	35.54	31.32	30.70	2.36

Notes: ROA = Return on assets; UWPR = Underwriting profit ratio; HHI = Herfindahl Hirschman index; CRA = Combined ratio; RIR = Reinsurance Ratio; LGWP = Gross written premium; LTA = Size of company; LEVR = Leverage Ratio; GDPG = % Gross domestic product growth rate; INF % = Inflation rate; FX = Exchange rate MR/USD

6.3 CORRELATION MATRIX

The Pearson correlation coefficient was estimated for the panel samples to examine the possibility of high correlation among the independent variables and also to test for the relationship between these independent variables and dependent variables. Table 5. shows the correlation coefficients and their respective significant levels for both dependent and independent variables. The results indicate that there is a positive and significant relationship between gross written premiums, size and return on assets (ROA) in the life industry, with 0.42 and 0.40 coefficient respectively.

There was also a negative but significant relationship between return on assets and combined ratio of life insurance companies, with an -0.54 co-efficient. The results further showed that there is no relationship between leverage and return on assets with zero co-efficient. The life results indicate that the relationship between underwriting profit ratio and LGWP, LTA, CRA mirrors that of the relationship between return on assets and these variables. There is a positive and significant association between UWPR and LGWP and LTA, while a negative relationship exists for UWPR and combined ratio (CRA), with coefficients of 0.62, 0.60 and -0.73, respectively under life sample. There's also evidence of a negative but insignificant association between ROA and the macro factors of GDPG, FX and Inflation rate under life industry. On the contrary, UWPR for life market was positively but insignificantly correlated with these GDPG, FX and inflation. Both life ROA and UWPR showed a negative and insignificant correlation to market structure proxied by HHI.

In the non-life market, evidence shows that ROA was weakly positive but significantly related to both gross written premium (LGWP) and size (LTA) with 0.28 and 0.36 coefficients respectively. The relationship between non-life underwriting profits ration (UWPR) and both gross written premium (LGWP) and size (LTA) was also a weak positive and significant association with coefficients of 0.38 and 0.28 respectively.

Similarly, there was a negative and significant correlation between UWPR and combined ratio (CRA) for non-life sample. Market structure was positively correlated to non-life UWPR and negatively related to non-life ROA with 0.03 and -0.06 coefficients respectively.

The inflation rate was significantly and positively correlated to GDPG but negatively related with foreign exchange (FX) at 0.78 and -0.83, respectively. Gross written premium (LGWP) was also, highly positively and significantly related to size (LTA) in both life and non-life samples, with 0.98 and 0.87 respectively. Dohoo et al., (1996) argue that multi-collinearity exists with correlation coefficients of 0.9 and above almost all the time, notwithstanding that it may also exist at lower coefficients. Additionally, the choice of variables to eliminate in the final modelling in the presence of high correlation is arbitrary and subjective. In this study, the highly correlated independent variables with coefficients above 0.70 were dropped in the final modelling used for the panel regression analysis and variables were subjectively eliminated.

Table 5: Result of correlation analysis

	HHI	LGWP	RIR	CRA	LEVR	LTA	INF	GDPG	FX	ROA	UWPR
NON-LIFE INSURERS											
HHI	1										
LGWP	0.07	1									
RIR	0.05	0.25**	1								
CRA	0.06	-0.39***	-0.07	1							
LEVR	-0.11	0.07	0.17	-0.28**	1						
LTA	0.12	0.87***	0.16	-0.14	-0.26**	1					
INF	-0.54***	-0.05	-0.04	-0.09	0.15	-0.11	1				
GDPG	-0.55***	-0.08	-0.02	-0.04	0.09	-0.11	0.78***	1			
FX	0.57***	0.01	0.05	0.13	-0.14	0.08	-0.83***	-0.49***	1		
ROA	-0.06	0.28**	-0.12	0.12	-0.13	0.36***	0.01	0.01	-0.04	1	
UWPR	0.03	0.38***	0	-0.36***	0.11	0.28**	-0.01	-0.04	-0.05	0.78***	1
LIFE INSURERS											
HHI	1										
LGWP	-0.02	1									
RIR	0.07	-0.27**	1								
CRA	0.22*	-0.68***	0.16	1							
LEVR	-0.22*	0.09	0.18	-0.37***	1						
LTA	0.03	0.98***	-0.28**	-0.58***	0.07	1					
INF	-0.65***	0.02	-0.07	-0.14	0.16	-0.02	1				
GDPG	-0.37***	-0.01	-0.04	-0.11	0.15	-0.04	0.78***	1			
FX	0.70***	-0.04	0.05	0.15	-0.21*	-0.01	-0.83***	-0.49***	1		
ROA	-0.12	0.42***	0.13	-0.54***	0	0.40***	0.03	0.06	0.05	1	
UWPR	-0.17	0.62***	-0.17	-0.73***	0.01	0.60***	0.14	0.13	-0.12	0.74***	1

Notes: ROA = Return on assets; UWPR = Underwriting profit ratio; HHI = Herfindahl Hirschman index; CRA = Combined ratio; RIR = Reinsurance Ratio; LGWP = Gross written premium; LTA = Size of company; LEVR = Leverage Ratio ; GDPG % = Gross domestic product growth rate; INF %= Inflation rate; FX= Exchange rate MR/USD.
*Signif. codes: p < .001, "***", p < .01, "**", p < .05, "*"*

6.4 TEST FOR HETEROSKEDASTICTY AND SERIAL CORRELATION

As discussed in Chapter 3 above, the Eicker, (1963) and White, (1980) sandwich estimator provide consistent regression estimates after correcting for heteroskedasticity. The Breusch-Goodfrey/Wooldridge (2002) test for serial correlation and the Breusch and Pagan, (1979) test for heteroskedasticity in panel sets were deployed. Evidence showed the presence of

heteroskedasticity in the both samples, with significant p-values less than one percent (1%). While no evidence of serial correlation was identified in both non-life and life samples, justifying the use of heteroskedasticity consistent covariance estimator. Table 6 presents a summary of the test for serial correlation and heteroskedasticity.

Table 6: Results of serial correlation and heteroskedasticity analysis

		LIFE INSURERS		NON-LIFE INSURERS	
Test	**Test Statistics**	**Model 1 ROA**	**Model 2 UWPR**	**Model 3 ROA**	**Model 4 UWPR**
Serial Correlation	**Chisq**	2.154	0.4536	0.046344	0.086761
	P -Value	0.1422	0.5006	0.8296	0.7683
Heteroskedasticity	**BP**	229.91	225.44	323.49	351.34
	P -Value	< 2.2e-16	< 2.2e-16	< 2.2e-16	< 2.2e-16

6.5 LAGRANGE MULTIPLIER TEST(LM), F-TEST AND HAUSMAN TEST

In choosing the most appropriate model to use for the analysis, the F-test for individual effect, the Breusch-Pagan (Lagrange Multiplier Test) and the Hausman test were employed. The F-test for individual effect compared the pooled OLS model with the fixed effect model, while the LM test compared the pooled OLS model to the random effect model. In Kaya, (2015) both the F-test and the LM test were used to determine the validity of the pooled OLS estimation technique similarly argued by Yerdelen Tatoğlu, (2013). For the purpose of this study if both the LM and F-test suggest no panel effects are present, the pooled OLS was adopted as the best model.

However, if either of the above models suggests the presence of panel or individual effects, this effect is decided using the Hausman test to identify the most valid model between fixed and random effects. Table 7 presents results of the F-test, LM and Hausman test.

From Table 7, the significant level of five percent (5%) was used for all tests and the results indicated that, in the life industry, both the F-test and LM test were insignificant under return on assets and hence, the null hypotheses of pooled OLS was accepted while the F and LM tests for underwriting profit ratio were both significant at five percent (5%) and hence the use of the Hausman test to decide on random effect. In non-life models, both the LM and the F tests were significant under both return on assets (ROA) and underwriting profit ratio (UWPR) and hence the Hausman test was used to decide on fixed effects for both models under the non-life sample.

Table 7: Results of Hausman test, LM test and F-test

		LIFE INSURERS		NON-LIFE INSURERS	
Test	**Test statistics**	**Model 1 ROA**	**Model 2 UWPR**	**Model 3 ROA**	**Model 4 UWPR**
LM TEST	**Chisq**	0.12946	8.2645	52.141	40.532
	P Value	0.719	0.004043	5.17E-13	1.93E-10
F-TEST	**F**	1.4	4.26	6.0026	4.6638
	P Value	0.1657	8.92E-06	1.21E-09	2.13E-07
HAUSMAN TEST	Chisq	5.4862	5.4848	15.492	29.047
	P Value	0.603	0.601	0.03019	0.000142

6.6 DISCUSSION OF REGRESSION RESULTS

The reliability of the regression result is justified by the F-statistic of pooled OLS and fixed effect techniques and by the Chisq of random effect technique. The F-test and Chisq statistics assess the overall and "joint significance of the independent variables in explaining changes in profitability" (Alhassan, Addison & Asamoah, 2015). With all the probability values of F-statistic and Chisq being significant at five percent (5%) in the life models techniques, the explanatory variables are said to indeed explain the variations in return on assets (ROA) and underwriting profit ratio (UWPR) under life samples. In the non-life sample however, the regression technique used to estimate what impacts underwriting profits ratio (UWPR) was found to be insignificant, with a probability value not significant at five percent (5%) but significant at ten percent (10%). The F-statistic of the model technique used in estimating impact of factors on the return on assets of the non-life sample was significant at five percent (5%) test level and hence it can be concluded that the variables in the model significantly explained the changes in return on assets.

Tables 8 and Table 9 present the results of the regression models which were estimated considering the model diagnostics described earlier. Additionally, the estimated R^2 for the two techniques used in life models indicate that about thirty-six percent (36%) and fifty-four percent (54%) variations in return on assets (ROA) and underwriting profit ratio (UWPR) respectively, are explained by the independent variables. In the non-life models, the R^2 indicates that about twenty percent (20%) of the variation in return on assets (ROA) and thirteen percent (13%) of the variations in underwriting profit ratio (UWPR) are accounted for by the independent variables.

HHI and Insurer's profitability

Across both models in the life sample, the coefficient of market concentration measured by HHI is negative and insignificantly related to return on assets (ROA) and Underwriting profit ratio (UWPR). The results show that the higher the concentration in the life industry, the lower is the life insurers' profitability, at both the operational level and net income level. This result does not support the structure-conduct-performance theory (SCP) in the life industry, irrespective of the evidence for higher concentration levels in the industry. The results infer that; higher competition leads to increased profitability. This can also be explained by the fact that, life insurers do not necessarily collude in setting prices; but it could be that insurers imitate the pricing models and behaviours of their competitors, especially that of market leaders, a characteristic of "oligopolistic markets where market leaders compete against each other" (Alhassan, Addison & Asamoah, 2015). The results for life sample also support the findings of (Berr-Stoilze et al., 2011).

With regard to the non-life industry, the results show mixed findings for the two models. There's a negative and significant effect of market concentration (HHI) on non-life insurers' return on assets (ROA) at the 10% significant level whereas positive and insignificant evidence was identified for the relationship between market structure and non-life insurers' underwriting profit ratio. The result for the model under return on assets does not support the S-C-P theory and indicates that non-life insurers' performance is actually based on competition and not collusion. On the other hand, the result for the model using underwriting profit ratio lends support to the S-C-P theory and can be explained as: underwriting profits of non-life insurers increase as market concentration also increases. However, given that the result is not significant presents weak evidence to conclude on the collusive behaviour of non-life insurers with regard to their underwriting activities.

Reinsurance ratio and insurers' profitability

The results of the impact of reinsurance show varying relationships with profitability for both life and non-life samples. The reinsurance ratio was positively but insignificantly related to return on assets (ROA) but positively and significantly related to the underwriting profit ratio (UWPR) in the life industry. This result lends support to Lee, (2014) who found a positive and significant relationship between operating ratio and reinsurance. In the non-life industry however, reinsurance

was negatively and insignificantly related to profitability in both underwriting profit ratio and return on assets models. The results in non-life indicate that insurers who are reinsurance dependent cede more of their premiums to reinsurance and keep lower retentions, which is likely to generate lower profits. The results in non-life support the findings of Hailegebreal, (2016) who found a negative and insignificant relationship between reinsurance ratio and insurer profitability in Ethiopia.

Size and insurers' profitability

Size of firm measured by the natural logarithm of total assets showed a varied relationship with insurer profitability in the life industry. There is a positive but insignificant relationship between size and return on assets in the life industry. A positive and significant association was found between size and underwriting profit ratio in the life industry. The results go to show that, larger insurance companies in the life industry are able to increase underwriting profitability by 0.0067%, given a unit percentage change in their total assets.

These findings confirm the results of Akotey et al., (2013) in the Ghanaian insurance markets, Chen & Wong, (2004) in the Asian insurance market, Charumathi, (2012) in the life insurance market in Indian and Ahmed et al., (2011) in the life insurance market in Pakistan. This means that insurers with larger asset sizes are better able to reach more customers through innovative means such as adopting new technologies, by virtue of their size. Larger firms are by virtue of their size, able to protect themselves from bad market conditions and reduce the impact of such negative changes. Size for the non-life industry was not tested in the model, due to the correlation between size and other variables and was arbitrarily eliminated in the final regression modelling of the non-life sample.

Leverage and insurers' profitability

Leverage was negatively and significantly related to return on assets (ROA). This result supports the findings of Charumathi, (2012) in the Indian life insurance market. Leverage was however, positively and significantly related to underwriting profit ratio in the life sample at 1% significant levels. Unlike life sample, leverage was negatively but insignificantly related to insurer profitability in the non-life sample. The results indicate that, an increase in leverage results in lower profitability by insurers. Hence highly levered insurance companies in Mauritius can be

considered unprofitable. The result is supported by Alhassan et al., (2015) for his study on the Ghanaian insurance markets, Datu, (2016) in the Philippines' insurance market Charumathi, (2012) in the Indian life insurance market and by Kaya, (2015) in the Turkish insurance markets.

Gross written premium and insurers' profitability

The amount of premium written has a positive and significant impact on profitability in both return on assets and underwriting profit ratio of the non-life sample. The significant impact of gross premiums written for both models shows that, growth in premiums lead to an increase in non-life insurers' profitability thus, return on assets and underwriting profits ratio. The evidence supports the findings of Akotey et al., (2013), Kaya, (2015) and conflicts with the findings of Burca and Batrinca, (2014) for their study on the Romanian insurance industry. Gross written premium was not tested for the life models, due to high correlation with other variables and was eliminated in the final regression modelling of life sample.

Combined ratio and insurers' profitability

Combined ratio comprises the underwriting losses and expense ratios of insurers. "Whereas the claims ratio measures underwriting efficiency, the expense ratio evaluates managerial competency" (Akotey et al., 2013). The regression results for impact of combined ratio on insurer performance in the life sample is a negative and significant relationship in both return on insurers' assets and underwriting profit ratio. The implication of this finding is that, insurers with higher combined ratios both suffer from high underwriting risks and have incompetent management, that is unable to efficiently manage resources and keep risks and cost under control.

The findings support the results of (Chen & Wong, 2004) who found a negative association between the financial health of insurers and combined ratio. Decomposing combined ratio into its elements of losses and expenses, the findings lend support to Akotey et al., (2013), Alhassan, Addison and Asamoah, (2015) and Kazeem, (2015) who found a negative association between insurers' profitability and loss ratios in their studies on Ghana and Nigeria. The results in the life markets support the efficiency theory which states that, insurers who operate efficiently earn economic rents while those who are inefficient operate at losses.

The impact of combined ratio on the non-life industry showed mixed results for the various models applied. There was a positive and significant relationship with insurers' return on assets and a negative and significant effect on underwriting profit ratio of non-life insurers at one percent (1%) significant levels. This unexpected positive relationship could be explained by the fact that, higher underwriting risk and management expense challenge management to take better decisions and also seek other alternative sources of income, such as better investments, choices that compensate for the high risks and expenses. The evidence of the non-life markets shows mixed findings and partly supports the efficiency theory and partly suggests that, insurers' profitability comes from sources other than efficiency.

GDP growth and insurers' profitability

The study presents mixed evidence of the association between economic growth measured by GDP growth (GDPG) and insurer profitability, in both markets for life and non-life, although such relationships were found to be insignificant in both samples. In the life market, GDPG is negatively and insignificantly related to return on assets, while a positive correlation exists between GDPG and underwriting profits ratio of life insurers. The results mean that the economy in Mauritius grows, life insurers' net income is inversely affected while their underwriting profits increase. In the non-life market, GDP is inversely and insignificantly related to both models of return on asset and underwriting profits ratio. This also implies that, as Mauritius experience economic growth, insurers' income at both the operational level and net income decreases. The result of negative correlation between insurer's return on assets and GDP supports the findings of Burca and Batrinca, (2014) but did not support the findings of Murungi, (2014). The negative association between economic growth and profitability could be explained by the fact that, with economic growth, consumers would rather seek alternative means such as investing, to achieve higher returns rather than buying insurance policies to manage their risks. The effect of this consumption behaviour on insurance, despite economic growth, is due to changes in lifestyle and consumption patterns.

Foreign exchange and insurers' profitability

The study found mixed results for the effect of foreign exchange on insurers' profitability. In the non-life sample, findings presented evidence of a negative and significant relationship between

return on assets, underwriting profit ratio and foreign exchange at ten percent (10%) and five percent (5%), respectively. This implies that, as the exchange rate of Mauritius depreciates, insurers' profitability is adversely impacted. This could be explained by the general economic contraction experienced by countries with depreciating currencies. Also, this could imply that most insurers pay out a huge portion of their premiums collected in MUR to foreign re-insurers hence, as the MUR depreciates it negatively affects their profitability as larger proportion of premiums collected is passed over to re-insurers.

However, in the life industry, no evidence of a significant relationship was found in both models. The results show a positive and insignificant relationship between insurer underwriting profit ratio and exchange rate, while a negative and insignificant relationship was found for insurer return on assets (ROA) and exchange rate.

Table 8: Result of panel regression analysis (Life Sample)

	ROA			**UWPR**		
	Pooled OLS			**RANDOM EFFECT**		
	β	**Std Error**	**t-statistic**	**β**	**Std Error**	**t-statistic**
INTERCEPT	0.5233***	0.1674	3.1259	0.0693	0.077	0.9007
HHI	-0.2622	0.2508	-1.0456	-0.0837	0.1545	-0.5421
RIR	0.0851	0.1084	0.7844	0.1363*	0.0772	1.7657
CRA	-0.0885***	0.0218	-4.0637	-0.0762***	0.0189	-4.025
LTA	0.0042	0.0055	0.7594	0.0067*	0.0034	1.9537
LEVR	-O.2560***	0.0777	-3.2973	0.1717***	0.05624	3.0532
GDPG	-0.0184	0.0245	-0.7505	0.0097	0.0085	1.1422
FX	-0.0012	0.0024	-0.502	0.0015	0.0017	0.8818
R2	**0.35611**			**0.55971**		
Adj. R^2	**0.30603**			**0.52547**		
F-Stat.	**7.11086**			**114.138**		
P-value	**9.36E-07**			**< 2.22e-16**		
Insurers	**17**			**17**		
Observations	**98**			**98**		

*Notes: ROA = Return on assets; UWPR = Underwriting profit ratio; HHI = Herfindahl Hirschman index; CRA = Combined ratio; RIR = Reinsurance Ratio; LGWP = Gross written premium; LTA = Size of company; LEVR = Leverage Ratio; GDPG % = Gross domestic product growth rate; INF % = Inflation rate; FX = Exchange rate MUR/USD; ***Signif. codes: '***' 0.01 '**' 0.05 '*' 0.1*

Table 9: Result of panel regression analysis (Non-Life Sample)

	ROA			UWPR		
	FIXED EFFECT			FIXED EFFECT		
	β	**Std Error**	**t-statistic**	**β**	**Std Error**	**t-statistic**
HHI	-0.6306*	0.3243	-1.9447	3.4005e-02	3.1319e-01	0.1086
RIR	-0.0987	0.0724	-1.3629	-7.5452e-02	9.2450e-02	-0.8161
CRA	0.0015***	0.0002	9.448	-6.6732e-04 ***	6.4308e-05	-10.3769
LGWP	0.0419***	0.0114	3.6687	1.8363e-02**	9.0972e-03	2.0185
LEVR	-0.0041	0.0795	-0.0516	-1.6529e-02	8.4430e-02	-0.1958
GDPG	-0.0027	0.0071	-0.3825	-5.4449e-03	6.8229e-03	-0.7980
FX	-0.0033*	0.0017	-1.9052	-3.5981e-03 **	1.7203e-03	-2.0916
R2	**0.2068**			**0.12906**		
Adj. R^2	**-0.0103**			**-0.10931**		
F-Stat	**3.5387**			**2.01102**		
P-value	**0.0020**			**0.061541**		
Insurers	**20**			**20**		
Observation	**122**			**122**		

*Notes: ROA = Return on assets; UWPR = Underwriting profit ratio; HHI = Herfindahl Hirschman index; CRA = Combined ratio; RIR = Reinsurance Ratio; LGWP = Gross written premium; LTA = Size of company; LEVR = Leverage Ratio; GDPG % = Gross domestic product growth rate; INF % = Inflation rate; FX = Exchange rate USD/MUR*** Signif. codes: '***' 0.01 '**' 0.05 '*' 0.1*

CHAPTER 7
SUMMARY, CONCLUSION AND RECOMMENDATION

7.1 INTRODUCTION

This chapter gives an overview of the study and provides a summary and concluding remarks on past studies and their empirical findings. The section also highlights implications of the findings on the various stakeholders in the Mauritian insurance industry. The chapter ends by assessing the various limitations of the study which prohibit generalizations and suggest further areas of research within the Mauritian industry and other sectors with similar applicability.

7.2 SUMMARY AND CONCLUSIONS

This research sought to examine the impact of firm characteristics and macroeconomic factors on the financial performance of both life and non-life insurance samples in Mauritius. In addition, the paper investigated the impact of industry concentration on insurers' performance by empirically testing the structure-conduct-performance hypothesis on both samples. The performances of insurers were measured by two profitability parameters: return on assets (ROA) and underwriting profit ratio (UWPR). These parameters were designed and applied in the study to capture performance at the core operational level and overall company performance, which factors in other sources of income such as investments.

The study tested these performance parameters against internal and external factors which included: gross written premium, size, leverage, combined ratio, reinsurance ratio, market structure, GDP growth and foreign exchange. The study, through panel regression techniques, estimated the impact of these independent variables on insurer profitability. Secondary data obtained from the Financial Services Commission (FSC) and the World Bank, spanning the period from 2008 to 2016 were deployed in the research for twenty non-life and seventeen life insurance companies.

The results showed that, combined ratio, leverage, reinsurance and size were the variables that impacted return on assets and underwriting profit ratio in the life markets. In the non-life market,

the study found significant evidence for combined ratio, gross written premium and foreign exchange and market structure as the variables impacting general insurers' profitability. The results show that a positive relationship exists between insurers size, gross written premium and insurers' profitability, while leverage was negatively related to profitability in both markets. However, market structure, combined ratio, foreign exchange and reinsurance ratio showed mixed evidence for their impact on insurer profitability in the various models applied in both markets.

7.3 IMPLICATIONS OF FINDINGS

The findings of the study have implications for the various stakeholders in the country and the insurance markets in Mauritius. For regulators of the insurance industry, the study recommends that policies that enhance competition be strengthened to maintain the industry as collusion-free, so that insurers' performances are based purely on their level of efficiency. For economic regulators such as the central bank, it is recommended that sound monetary policies that strengthen foreign exchange be initiated, to keep various sectors especially the insurance markets' exposure positive. Internal stakeholders are admonished to pay particular attention to the growth strategies of their companies. This is because evidence points to the fact that, increase in size of companies lead to an increase in insurer profitability.

Growth strategies such as healthy mergers and acquisitions could be considered and other organic growth such as new branches, adoption of new technologies should be part of a company's strategic objectives. It is further recommended that insurers pay attention to their capital structure and should manage the amount of leverage relied on, in order to avoid challenges of insolvency. In addition, it is suggested that insurers seek more efficient ways to manage their expenses and transfer risks to third parties in cases where insurers underwrite high risk policies or underwrite more less risky policies, to compensate for those inherently risky ones. Managements of insurance companies are also urged to invest in premium growth strategies to boost profitability. However, it is highly recommended that insurers avoid unnecessary price cutting, stemming from unhealthy competition in an attempt to boost premium growth, as such means are unsustainable and inherently risky.

7.4 LIMITATIONS OF THE STUDY

Given that the study covered a specific period from 2008 to 2016, the results of the study are valid for only the period under review and may not be extended to periods outside of the scope of this study. Also, missing data for some insurers could render the results invalid and limits generalization of findings. The author used subjective estimations for variables, due to unavailable data and could cause biases and limit validity of results. Finally, the results are valid for the country under investigation and may not be generalized to other countries.

7.5 AREAS OF FURTHER RESEARCH

Further research could be done to examine the impact of efficiency and relative market power hypotheses on the Mauritian insurance industry. Again, further research could be carried to test different forms of financial performance against similar or different internal and external factors in the insurance markets of Mauritius. Finally, the studies could be replicated for different sectors in Mauritius to ascertain if similar results are applicable.

REFERENCES

Adams, M. and Buckle, M. (2003). The determinants of corporate financial performance in the Bermuda insurance market. *Applied Financial Economics*. 13(2): 133-143.

Agabi, A. (2009). Insurance-Nigeria: Operators excited at uniform rules in oil and gas underwritings. Available from: http://www.allafricquest.com/snews/africa.

Ahiawodzi, A. and Sackey, F.G. (2010). Determinants of Commercial Banks' Profitability in Ghana: A Panel Evidence for the period 1999-2008. *International Journal of Economics and Development.* 9 (1/2): 56-67

Almajali, Y.A., Alamro, S.H., and Al-Soub, Y.Z. (2012). Factors affecting the financial Performance of Jordanian insurance companies listed at Amman stock exchange. *Journal of Management Research*. 4(2): 91-101.

Alomari, M.W. and Azzam, I.A. (2017). Effect of the Micro and Macro Factors on the Performance of the Listed Jordanian Insurance Companies. *International Journal of Business and Social Science.* 8(2): 67-73.

Al-Shami, H. (2008). Determinants of Insurance Companies Profitability in UAE. Master of Science in Finance, University of Utara Malaysia. Available from: http://ep3.uum.edu.my/256/.

Alhassan, A.L., Addisson, G.K. and Asamoah, M.E. (2015). Market structure, efficiency and profitability of insurance companies in Ghana. *International Journal of Emerging Markets*. 10(4): 648 – 669.

Akotey, J.O., Sackey, F.G., Amoah, L. and Frimpong-Manso, R. (2013). The Financial Performance of Life Insurance Companies in Ghana. *The Journal of Risk Finance*. 14(3): 286-302.

Ana-Maria Burca and Ghiorghe Batrînca, (2014). The Determinants of Financial Performance in the Romanian Insurance Market. *International Journal of Academic Research in Accounting, Finance and Management Sciences*. 4(1): 299–308.

Asteriou, D. and Hall, S. (2007) Applied Econometrics: A Modern Approach. Palgrave Macmillan, New York.

Bain, J.S., (1951). Relation of Profit-Rate to Industry Concentration: American Manufacturing, 1936-1940, *Quarterly Journal of Economics*. 65 (3): 293-324.

Baltagi, B.H. (2005) Econometric Analysis of Panel Data. 3rd Edition, John Wiley & Sons Inc., New York

Bajtelsmit, V.L. and Bouzouita, R. (1998). Market Structure and Performance in Private Passenger Automobile Insurance. *The Journal of Risk and Insurance*. 65 (3): 503-514.

Berteji, A., and Hammami, S. (2016). The Determinants of the Performance of the Life Insurance Companies in Tunisia. *International Journal of Economics, Commerce and Management*. 4(7): 334-343.

Berger, A.N. and Hannan, T.H. (1993). Using Efficiency Measures to Distinguish Among Alternative Explanations of the Structure-Performance Relationship in Banking, *Finance and Economics Discussion Series (FEDS*) No. 93-18, Board of Governors of the Federal Reserve System.

Berry-Stölzle, T.R., Weiss, M.A. and Wende, S. (2011). Market Structure, Efficiency, and Performance in the European Property-Liability Insurance Industry. Working Paper, Temple University, Philadelphia, PA, USA.

Boadi, E.K., Antwi, S. and Lartey, V.C. (2013). Determinants of Profitability of Insurance Firms in Ghana. *International Journal of Business and Social Research (IJBSR)*, 3 (3): 43-50.

Boyjoo, T., and Ramesh, V. (2017). A study on factors influencing performance of General Insurance Companies in Mauritius- An empirical evidence. *International Journal of Conceptions on Management and Social Sciences 5(1):23-29.*

Boyjoo, T., Ramesh, V., and Jaunky, V.C. (2017) Determinants of The Mauritian Life Insurance Industry's Performance– An Empirical Study. International Journal of Management and Applied Science, 3(5):129-134.

Breusch, T.S. and Pagan, A.R. (1980). The Lagrange Multiplier Test and its Application to Model Specification in Econometrics, 47 (1): 239–254.

Browne, M.J., Carson, J.M. and Hoyt, R.E. (2001). Dynamic financial models of life insurers. *North American Actuarial Journal*. 5(2): 11-26.

Buyinza, F., Francois, J. and Landesmann, M. (2010). Determinants of profitability of commercial banks in Sub Saharan Africa countries. Department of Economics, Johanssen Keppler University, Linz Austria.

Carson, J.M. and Hoyt, R.E. (1995). Life insurer financial distress: Classification models and empirical evidence. *Journal of Risk and Insurance.* 62(4): 764–775.

Çekrezi, A. (2015). Determinants of Financial Performance of The Insurance Companies: A Case Of Albania. *International Journal of Economics, Commerce and Management*. 3(4): 1-10.

Charumathi, B. (2012). Determinants of profitability of Indian life insurers: An empirical study. *World Congress on Engineering*, 1(7): 978-988.

Chen, R. and Wong, K.A. (2004), The Determinants of financial health of Asian Insurance Companies. *The Journal of Risk and Insurance*, 71(3): 469-499.

Choi, B.P. and Weiss, M.A. (2005). An empirical investigation of market structure, efficiency, and performance in property-liability insurance. *Journal of Risk and Insurance*, 72(4): 635-673.

Cole, R.C., He, E. and Karl, J.B. (2015). Market Structure and the Profitability of the U.S. Health Insurance Marketplace: A State-Level Analysis. *Journal of Insurance Regulation*. 34(4).

Cummins, D.J. and Nini, G. (2002). Optimal Capital Utilization by Financial Firms: Evidence from the Property-Liability Insurance Industry, *Journal of Financial Services Research*, 21(1-2): 15-53.

Cummins, D.J. (1990). Asset Pricing Models and Insurance Ratemaking, ASTIN Bulletin. *Journal of the International Actuarial Association. 20 (2): 125-166*

Ćurak, M., Pepur, S. and Poposki, K. (2011). Firm and Economic Factors and Performance: Croatian Composite Insurers. *The Business Review Cambridge*. 19(1): 136-142.

Daare, W.J. (2016). Factors Affecting General Insurance Companies Profitability: Empirical Study in India. *International Journal of Marketing, Financial Services & Management Research*. 5(12): 1-8.

Datu, N. (2016). How do insurer specific indicators and macroeconomic factors affect the profitability of insurance business? A panel data analysis on the Philippine Non-life Insurance market. *The DLSU Research Congress.* 4(1): 2449-3309.

Demsetz, H. (1973). Industry Structure, Market Rivalry and Public Policy. *Journal of Law and Economics*, 18(3): 79-86.

Department of Justice. Antitrust Division. Retrieved from United States Department of Justice: https://www.justice.gov/atr/herfindahl-hirschman-index

Derbali, A. and Jamel, L. (xxxx). Determinants of Performance of Tunisia insurance companies: case of life insurance. *International Journal of Productivity and Quality Management.*

Dohoo, I.R., Ducrot, C., Fourichon, C., Donald, A. and Hurnik, D. (1996). An overview of techniques for dealing with large numbers of independent variables in epidemiologic studies. *Preventive Veterinary Medicine*. 29 (3): 221-239.

Doreen, U.M. (2014). Relationship between Macroeconomic Variables and Financial Performance of Insurance Companies in Kenya. Unpublished MSC project, University of Nairobi.

Doumpos, M. and Gaganis, C. (2012). Estimating and explaining the financial performance of property and casualty insurers: A two-stage analysis. *The Business and Economics Research Journal*. 5(2): 155-170.

Edlira, L., Kripa, D. and Ajasllari, D. (2016). Assessment of Insurance Companies Profitability – cases in Albania, *International Scientific Conference – ERAZ 2016: Knowledge Based Sustainable Economic Development.*

Eicker, F. (1963). Asymptotic normality and consistency of the least squares estimators for families of linear regressions. *The Annals of Mathematical Statistics*, 34, 447–456.

Ezirim, C.B., Ezirim, U.I., Eniekezimene, D. and Elike, U. (2017). Finametric Determination of Insurance Profitability: Analysis of the Nigerian Experience. *Archives of Business Research. 5(12),* 50-62.

Financial Services Commission, (2017). Annual Report 2016/2017.

Financial Services Commission, 2008-2017 Annual statistical Bulletins, Mauritius.

FRED Economic Data (2017). Insurance company assets to GDP for Mauritius. ST. Louis FED Retrieved from: https://fred.stlouisfed.org/series/DDDI11MUA156NWDB.

Ghimire, R. (2013). Financial Efficiency of Non-Life Insurance Industries in Nepal. *Lumbini Journal of Business and Economics*, 3 (2).

Gikungu, H.M. (2012). The impact of macroeconomic variables on the performance of the Nairobi securities exchange. Unpublished MBA project, University of Nairobi.

Gonga, A.M. and Sasaka, P.S. (2017). Determinants Of Financial Performance Of Insurance Firms: A Survey Of Selected Insurance Firms In Nairobi County. J*ournal of Management*. 4 (8): 123-143.

Grace, M.F. and Hotchkiss J.L. (1995). External Impacts on the Property-Liability Insurance. *Cycle Journal of risk and insurance*. 62 (4).

Greene, W.H. and Segal, D. (2004). Profitability and Efficiency of U.S life Insurance Industry. *Journal of Productivity Analysis*. 21(3): 229-247.

Greene, W.H. (2008). Econometric Analysis. 6th ed. Upper Saddle River, New Jersey: Prentice Hall.

Hailegebreal, D. (2016). Macroeconomic and Firm Specific Determinants of Profitability of Insurance Industry in Ethiopia. *Global Journal of Management and Business Research: C Finance*, 16(7):26-36.

Haiss, P. and Sümegi, K. (2008). The relationship between insurance and economic growth in Europe: A theoretical and empirical analysis. *Empirica*, 35(4): 405-431.

Hardwick, P., and Adams, M., (1999). Firm Size and Growth in the UK Insurance Industry. School of Finance & Law; Working Paper Series, No. 16.

Harvey, H. (2012). Exchange-Rate Volatility and Money Demand in Selected South East Asian Countries. *Economics and Finance Review*. 2 (10): 1-7.

Hausman, J.A. (1978). Specification tests in econometrics. *Econometrica.46:* 1251–1271.

Hicks, S. (2000). Macroeconomic indicators that are useful for insurance companies

Hussain, Ijaz. (2015). Macro Economy and Profitability of Insurance Companies: A Post Crisis Scenario in Pakistan (Forthcoming). *Pakistan Business Review*. 17.

Jensen, M. C., and Meckling, W. H. (1976). Theory of firm: Managerial behaviour, agency costs and ownership structure. *Journal of Financial Economics, 3*(4), 305-360.

Kasturi, R. (2006). Performance Management in Insurance Corporation. *Journal of Business Administration Online,* 5 (1)

Kaya, Ö.E. (2015). The Effects of Firm-Specific Factors on the Profitability of Non-Life Insurance Companies in Turkey. *International Journal of Financial Studies*, 3(1): 510-529.

Kaya, Ö. E. (2013). Capital Adequacy in the Insurance Business and Assessment of Turkish Insurance Sector within the Scope of Solvency II. Ph.D. Thesis, Gazi University, Ankara, Turkey.

Kazeem, H.S. (2012). Firm Specific Characteristics and Financial Performance Of Listed Insurance Firms In Nigeria. Ahmadu Bello University, Zaria, Nigeria, *M.Sc./ADMIN/9962/2011-2012.*

Kozak, S. (2011). Determinants of Profitability of Non-Life Insurance Companies in Poland during Integration with the European Financial System, *Electronic Journal of Polish Agricultural Universities,* 14 (1).

Kripa, D. and Ajasllari, D. (2016). Factors Affecting the Profitability of Insurance Companies in Albania. *European Journal of Multidisciplinary Studies*, 1 (1): 352-360.

Kwaning, E.A., Awuah, P.K. and Mahama, M.B. (2015). Factors Affecting Financial Performance of Non-Life Insurance Companies in Ghana. *Africa Development and Resources Research Journal*, Ghana. 2(5): 19-37.

Lambe, I. (2015). Assessing the Impact of Exchange Risk on Banks Performance in Nigeria. *Journal of Economics and Sustainable Development*. 6 (6).

Lee, C.Y. (2014). The Effects of Firm Specific Factors and Macroeconomics on Profitability of Property-Liability Insurance Industry in Taiwan. *Asian Economic and Financial Review*, 4(5): 681-691.

Lee, H.H. and Lee, C.Y. (2012). An analysis of reinsurance and firm performance: Evidence from the Taiwan property-liability insurance industry. *The Geneva Papers on Risk and Insurance-Issues and Practice*, 37(3): 467-484.

Macfubara, M.S., Norteh, D., and Gberesuu, B.B., (2018), Monetary Policy and Return on Equity of Quoted Insurance Firms: A Time Series Study from Nigeria, *American Finance & Banking Review*; Vol. 2, No. 1, 62-76

Malik, H. (2011). Determinants of insurance companies profitability: An analysis of insurance sector of Pakistan. *Academic Research International*, 1(3): 315-321.

Mason, E.S. (1939). Price and Production Policies of Large-Scale Enterprise, *American Economic Review*, 29: 61-74.

Martin, A.D. and Mauer L.J. (2003). Exchange Rate Exposures of U.S. Banks: A Cash Flow-Based Methodology. *Journal of Banking and Finance* 27: 851-865.

Mauritius IFC, (2016). Sectors and Opportunities: Insurance. Available at; http://www.mauritiusifc.mu/en/insurance/

Mwangi, M. and Iraya, C. (2014). Determinants of Financial Performance of General Insurance Underwriters in Kenya. *International Journal of Business and Social Science*. 5(13): 210-215.

Mwangi, F.K. (2013). The effect of macroeconomic variables on financial performance of Aviation Industry in Kenya. Unpublished MSC project, University of Nairobi, 2013.

Mwangi, M. and Murigu, J.W. (2015). The Determinants of Financial Performance in General Insurance Companies in Kenya. *European Scientific Journal.* 11 (1): 288-297.

Munyambonera, E.F. (2013). Determinants of Commercial Bank Profitability in Sub-Saharan Africa. *International Journal of Economics and Finance.* 5(9): 134-147.

Murungi, D.U. (2014), "Relationship between macroeconomic variables and financial performance of insurance companies in Kenya", unpublished master's thesis, University of Nairobi.

Muya, C.M. (2013*).* An Investigation into Factors that Determine Financial Performance of Insurance Companies in Kenya. Unpublished MBA project, University of Nairobi.

Naveed, A., Zulfqar, A. and Ahmad, U., (2011). Determinants of Performance: A Case of Life Insurance Sector of Pakistan, International *Research Journal of Finance and Economics*, Euro journals Publishing, Inc.

Pervan, M., and Pavić, K.T. (2010). Determinants of insurance companies' profitability in Croatia. *The Business Review Cambridge*, 16(1): 231-238.

Philip G Berger; Eli Ofek and David Yermack, (1997), Managerial Entrenchment and Capital Structure Decisions, *Journal of Finance*, **52**, (4), 1411-38

Pope, N. and Ma, Y. (2008). The Market Structure: Performance Relationship in the International Insurance Sector. *The Journal of Risk and Insurance*. 75 (4): 947-966.

PWC, (2018) Ready and Willing: African Insurance Industry Poised for Growth. Retrieved from https://www.pwc.co.za/en/assets/pdf/south-african-insurance-2018.pdf

Rhoades, S.A. (1985). Market Share as a Source of Market Power. Journal *of Economics and Business*, 37: 343–363.

Rhoades, S.A. (1993). The Herfindahl Hirschman Index. *Federal Reserve Bulletin*, Vol. 79 (March), pp. 188-89.

Ross, S.A. (1976). The Arbitrage Theory of Capital Asset Pricing. *Journal of Economic Theory*, 13: 341-360

Ross, S.A. (1973). The Economic Theory of Agency: The Principal's Problem. *The American Economic Review*. 63 (2): 134-139.

Qian, J. (2019). An Introduction to Asset Pricing Theory. Retrieved from http://jhqian.org/apt/apbook.pdf.

Russo, M.V., and Fouts, P.A. (1997). A resource-based Perspective on Corporate Environmental Performance and Profitability. *Academy of Management Journal*, 40(3): 534–559.

Sambasivam, Y. and Ayele, A.G. (2013). A Study on the Performance of Insurance Companies in Ethiopia. *International Journal of Marketing, Financial Services & Management Research*, 2(7): 138-150.

Scherer, F.M. and Ross, D. (1990). Industrial Market Structure and Economic Performance, Houghton Mifflin, Boston, MA.

Schanz, Alms and Company. (2016). Market Overview. *African Reinsurance Pulse*. Retrieved from, https://pulse.schanz-alms.com/africa-reinsurance-pulse/2016/market-overview

Shepherd, W.G. (1986). On the Core Concepts of Industrial Economics, in: H.W. de Jong, and W.G. Shepherd eds., Mainstreams in Industrial Organization (Boston: Kluwer Academic).

Shui, Y. (2004). Determinants of United Kingdom General Insurance Company Performance. *British Actuarial Journal.* 10 (5): 1079-1110.

Stanwick, P. and Stanwick, S. (2000). The relationship between environmental disclosures and financial performance: An empirical study of US corporations. *Eco-Management and Auditing*, 7, 155-164.

Stigler, G.L. (1964). A Theory of Oligopoly, Journal *of Political Economy*, 72: 44-61.

Suzane, M.M., Dumbor, N. and Gberesuu, & Barry, B. (2018). Monetary Policy and Return on Equity of Quoted Insurance Firms: A Time Series Study from Nigeria. *American Finance & Banking Review*.2(1): 62-76.

Swiss Re, (2018). World Insurance in 2017: Solid, But Mature Life Markets Weigh on Growth: Sigma, 3

Swiss Re, (2018). Profitability in Non-Life Insurance: mind the gap: *Sigma*, 4

Swiss Re (2008). Profitability of Non-Life Insurance Industry, Egypt, Available At; www.insureegypt.com.

Torres-Reyna, O. (2007). Panel Data Analysis Fixed and Random Effects using Stata, Princeton University.

Vittas, D. (2003). "The Insurance Industry in Mauritius", Policy Research Working Paper, Financial Sector Operations and Policy Department, The World Bank.

Walker, D. (2001). Exploring the human capital contribution to productivity, profitability and the market evaluation of the firm. Retrieved from; http:/wwwlib.umi.com/dissertations.

Wani, A.A. and Dar, S.A. (2015). Relationship between Financial Risk and Financial Performance: An Insight of Indian Insurance Industry. *International Journal of Science and Research*. 4 (11): 1424-1433.

Weiss, L.W. (1974). The concentration-profits relationship and antitrust. In Industrial Concentration: The New Learning, H.J. Goldschmid, H.M. Mann, and J.F Weston, Eds., Boston: Little, Brown 184-245.

White, H. (1980). A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. *Econometrica*, 48: 817–838.

Yerdelen Tatoğlu, F. (2013). *Panel Veri Ekonometrisi Stata Uygulamalı*, 2nd Ed.; Beta BasımYayımDağıtım: Istanbul, Turkey, 2013.